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# USSR Report

ECONOMIC AFFAIRS

EKO: ECONOMICS AND ORGANIZATION  
OF INDUSTRIAL PRODUCTION

No 5, May 1985



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USSR REPORT  
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## WARTIME INDUSTRY IN SOVIET UNION DISCUSSED

Novosibirsk EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA (EKO) in Russian No 5, May 85 pp 3-18

[Article by B. P. Orlov, doctor of economic sciences, professor, Institute of Economics and Organization of Industrial Production of the Siberian Branch of the USSR Academy of Sciences (Novosibirsk): "Soviet Industry During the Period of the Great Patriotic War"]

[Text] War on the Threshold

By the end of the 1930's international relations had sharply deteriorated and the danger of an attack from imperialist forces on the Soviet Union had clearly increased. The need to strengthen the defense capabilities of the USSR brought about the rapid growth of the military consumption fund. From 1939 through 1941 the number of personnel in the USSR armed forces more than tripled.<sup>1</sup> At the same time the output of defense products from industry increased at accelerated rates and strategic reserves of equipment, foodstuffs and industrial raw material were accumulated. In 1939 we began reconstruction of existing aircraft plants and the construction of new ones. The overall number of these was to have doubled by the end of 1941. The average annual rate of increase in defense output from USSR industry according to the plan for the 3rd Five-Year Plan was 27.3 percent, and during 1938-1940 it actually reached 41.5 percent.<sup>2</sup>

Because of this it was necessary to redistribute the material resources and labor force in favor of defense industries and those that directly serve them. Thus for the production of tanks, along with the Kirov Plant in Leningrad and the Kharkov Tractor Plant, the Stalingrad and Chelyabinsk tractor plants were subsequently also changed over to tank production.

Because of the shortage of resources it was necessary even to draw on the consumption fund of the population. Thus in order to equalize the supply and demand for consumer goods, in 1939-1940 retail prices were raised significantly for a wide range of goods that were in daily demand, including high-calorie food products. According to some calculations, the index of retail prices in the planned commodity turnover and public catering in 1940 was higher than in 1937 by almost 20 percent.<sup>3</sup> As a result of this and also the redistribution of resources in favor of the armed forces, in 1940 the population was forced to reduce the purchases of food products in the stores

and public catering network by 6.6 percent as compared to the preceding years (at the same prices).<sup>4</sup> The structure of the consumption of foodstuffs deteriorated. In 1940 the volume of introduction of new residential space decreased by one-third and the number of people studying in schools, technicums and VUZes also decreased.<sup>5</sup> The latter was related to the introduction of the payment for study in the senior classes of the secondary school, technicums and VUZes and the sharp reduction of the stipend fund. In a word, the preparation for fighting off aggression required certain sacrifices from the Soviet people.

For purposes of forced development of the country's defense potential industrial facilities were constructed at accelerated rates in the eastern regions of the USSR, new railroad lines were constructed and measures were taken to overcome the insufficient handling capacity of a number of lines and the shortage of rolling stock. The central task of the National Economic Plan for 1941 was mobilization of all resources for strengthening the defense might of the USSR. With an increase in the growth output of all industry of 17 percent, it was planned to increase the output of the defense branches by 46 percent during 1941.<sup>6</sup> There was a sharp increase in the production of new kinds of military equipment: aircraft, tanks, arms with modern designs, mortars, small arms and so forth.

These measures made it possible to increase the military readiness of the Soviet armed forces. But their effect turned out to be limited: the time had passed for the organization of mass production of modern means of waging war and the process of intensive equipment of the Soviet army and navy had only begun. "The rearmament of the armed forces with new material means began in practice in the first half of 1941...by the beginning of the war we still had very few new aircraft...."<sup>7</sup> In Germany at the beginning of World War II about one-fourth of all the industrial workers were employed in the military industry.<sup>8</sup> In the USSR the proportion of defense enterprises in the overall number was considerably lower.

A number of branches of industry in the USSR whose products were used extensively for the production of objects for military consumption, especially ferrous and nonferrous metallurgy and the chemical industry, were increasing production slowly during the prewar years. In 1940 they smelted 0.6 million tons more steel and 0.4 million tons more iron than in 1937. For a long time there was a great strain in the formation of the country's fuel and energy balance. Even enterprises of the defense industry and rail transportation experienced interruptions in the delivery of fuel. Thus during the winter of 1938 it was necessary to abolish the departure of a large number of trains because of the lack of fuel. It reached a point where the railroad workers would detach carloads of coal which were designated for other consumers and use them for their own needs, and the Economic Council under the USSR Soviet of People's Commissars was forced to impose sanctions for these arbitrary actions.<sup>9</sup>

During these years Germany not only fully satisfied its own needs through its own mining of hard coal, but also exported fairly significant quantities of it. The production of ferrous metals was increasing fairly rapidly there and the supplies of strategic raw material were increasing intensively. Thus the

smelting of steel in 1941 as compared to 1937 increased by 8.4 million tons, and iron--by 5.4 million tons.<sup>10</sup> Germany took first place in the world in the production of aluminum. On the eve of the attack on the USSR in terms of the availability of military and economic resources fascist Germany surpassed our country 1.5-2-fold.<sup>11</sup>

#### The Changeover of Industry to Defense Production

In order to eliminate the temporary superiority of the aggressor over the USSR armed forces in both the quantity and quality of military means, especially tanks and aircraft, it was necessary to develop large-scale production of these in the shortest possible period of time. But the objective conditions of the first period of the war turned out to be extremely unfavorable for this. The conquest of a considerable part of the territory of European regions of the country by Hitler's troops, the attacks by any enemy aircraft and artillery and the sabotage in the rear led to the loss of labor resources, production equipment and supplies of ordinary products, and to the destruction of transportation arterials, means of communication and so forth. By the end of 1942 the losses of fixed production capital caused by Hitler's aggression reached approximately one-third of their prewar value. The forced evacuation of defense enterprises and those that serve them to the remote regions of the country for a more or less long period of time caused large production capacities to cease operating. A considerable number of industrial workers had to be called into the armed forces.

The shutdown of enterprises in the Ukraine and in industrial centers in the Northern Caucasus, Rostov, Leningrad, Bryansk and so forth and the mass shifting of enterprises to the remote regions of the country created critical disproportions in the national economy. Thus the stoppage of deliveries of manganese from Nikopol, tungsten and molybdenum from the Northern Caucasus and aluminum from the Dnepr area and Volkhov placed ferrous metallurgy plants and the defense industry in a difficult position. In many cases it was necessary to use aircraft to ship in aluminum.

Enterprises whose products comprised two-fifths of the gross output of all USSR industry in 1940 were moved to the remote regions of the country.<sup>12</sup> At the same time more than 10 million people were sent to the rear regions before the end of 1941.<sup>13</sup> Additionally, they rebased almost three-fourths of the enterprises of the arms and shipbuilding industry, all specialized tank plants, more than 150 machine-building and metal-processing enterprises, and so forth.<sup>14</sup> Moving them to new regions involved overcoming many difficulties. There was not enough electric energy, especially in the Ural area, which received most of the evacuated enterprises. The production ties between plants and clients which had been formed over the years were broken. Transportation operated irregularly. In many places there were no supplies of raw material and fuel, nor did they have the necessary construction base. They experienced a critical shortage of labor force: as a rule, only 30-40 percent of the workers were transferred along with the enterprise and in the new places there was almost no trained labor force. The evaluated population found very poor living conditions. In a number of cities of the rural area there were up to 2-2.5 square meters of dwelling space for each individual.<sup>15</sup> The population suffered immense food deprivation and the consumption of



industrial goods and services was curtailed. Thus while before the war the food ration of an adult urban resident reached 3,370 calories, in 1942 it decreased to 2,555 calories, that is, by 24 percent.<sup>16</sup>

The socialist organization of public production and the self-sacrifice of the workers made it possible to transfer industry over to a military basis in a relatively short period of time. It was necessary to overcome immense difficulties here. The maximum decline of industrial production took place in November 1941: as compared to June 1941 the volume of industrial output decreased to less than one-half its previous amount. At the same time the evacuated enterprises were either still "on the road" or had been located in new places. During the subsequent winter months this critical peak was passed, but the increase in output was unstable and insignificant. The summer attack of Hitler's troops in 1942 worsened the conditions for the formation of the military economy, causing a second, although not as strong, wave of evacuation and breaking the production and transportation ties between the rear regions and the Northern Caucasus and the Transcaucasian areas.

On the whole the decline in production caused by the war reached its maximum in 1942. But during the second half of the year, thanks to the rear regions, it was possible to achieve an overall turnaround in the work of industry. By the middle of 1942 more than 1,200 of the 1,360 large industrial enterprises that had previously been evacuated here were restored and began to produce products in growing amounts.<sup>17</sup> Defense production was increasing at many of the "root" enterprises of the rear regions, the associated plants were transferred over to new interbranch and territorial ties, additional labor force was enlisted in production, the length of the work day was increased, and so forth. By the end of 1942 the changeover of enterprises from ordinary production to defense production was complete, and mass flow-line output of new kinds of military equipment and accessories was organized.

As a result, in 1942 USSR industry produced more military equipment than German industry did.<sup>18</sup>

"Everything for the Front, Everything for Victory!"

Of decisive significance for the creation of a powerful defense potential for the USSR was the radical and consistent redistribution of resources in favor of the branches of industries which directly formed the fund for military consumption, provided implements and means of labor for the defense industry, and also supported the reproduction process in heavy industry. The scale of the redistribution was determined not only by the gigantic increase in the defense needs, but also by those irreplaceable losses which the country's economy sustained from the military actions and the temporary loss of part of its territory. In the USSR this redistribution took place more consistently and radically than in other large countries that were participating in the war. Thus in 1942 the USSR passed Germany up in terms of the amount of output of aircraft, tanks and other military equipment, while at the same time it had a great deal less resources of fuel, metal and other intermediate products. One can judge the scale of the work done in the USSR from the figures in the table.



Structure of Utilized National Income of USSR in 1940 Prices, % of Total

<u>Indicators</u>	<u>1940</u>	<u>1944</u>
Consumption	74.0	60.5
Accumulation	17.5	13.4
Military expenditures	7.2	25.4
Economic reserves	1.3	0.7

Source: TsGANKh, f. (fund) 4372, op. (inventory) 46, d. (file) 249, l. (sheet) 2.

Of the overall consumption fund the civilian population in 1940 received 70 percent and in 1944--49.5 percent; the proportion received by military service personnel increased correspondingly from 4 to 11 percent. If one were to sum up the military outlays (expenditures on the acquisition of military equipment, accessories and so forth) along with that which was consumed by armed forces personnel, the proportion of the military consumption fund increased from 11.2 percent in 1940 to 36.4 percent in 1944. As one can see from the figures that are given, in the composition of the newly created value that was utilized there was a sharp reduction in the proportion of personal and collective consumption on the part of the civilian population. This consumption decreased sharply in absolute terms as well, which is reflected, particularly, in the dynamics of the planned retail commodity turnover (in comparable prices): in 1942 it dropped to 34 percent, and in 1943--even to 32 percent as compared to 1940.<sup>19</sup> The volume of sales of agricultural products on the unorganized market as compared to 1940 amounted to (in comparable prices): in 1941--81.8 percent, in 1942--42.1 percent, in 1943--56.1 percent, and in 1944--55.1 percent.<sup>20</sup> The reduction of commodity resources was accompanied by an increase in retail prices. According to approximate calculations, the average weighted index of retail prices for the state and cooperative trade network and the unorganized market in 1945 amounted to 325 percent of the average annual level in 1940. The increase in consumer expenditures on the part of workers and employees was not compensated for by an increase in their nominal wages. As a result, the real earnings in 1945 decreased to 43 percent of the amount in 1940.<sup>21</sup> According to approximate calculations, the per capita fund for private consumption during the war years decreased by 35-40 percent.<sup>22</sup> Such was one of the major sacrifices placed on the altar of victory by the Soviet people.

The consumption fund of the population decreased mainly as a result of the sharp decline in the production of agricultural products and partially because of the redistribution of the reduced amount of raw material resources in favor of heavy industry. All industrial production of objects of consumption decreased in 1942 to 41 percent of the 1940 level, reaching 59 percent in 1945.<sup>23</sup>

In selling the consumption fund natural priority was given to armed forces personnel, and after them (in the state sector of the economy)--to workers in the military industry and decisive branches of heavy industry. By the end of the war the maximum norms for food supply for workers according to the card catalogues exceeded the minimum norms for grain--1.4-fold, sugar and

confectionery items--1.25-fold, and meat, fish, fats and groats--2.5-fold.<sup>24</sup> Workers in the military industry were granted advantages in wages over workers in civilian industry. The limitedness of the resources caused a tendency toward a kind of equalization of consumption in each of the groups of the population which were centrally supplied with food products and other goods (which was insured by the norms for sales according to the card catalogue system) and reduced the possibilities of material stimulation of labor.

The lack of statistical data makes it impossible to evaluate the volume and dynamics of consumption by the kolkhoz peasantry. Its monetary income, apparently, increased significantly. Some of the food supply that belonged to the kolkhoz workers was sold by them on the unorganized market with price dynamics that were very favorable for them: in the cities in 1943 the prices on this market increased 13-fold as compared to 1940.<sup>25</sup> This led to a spontaneous redistribution of monetary funds from the urban population to the holders of the food supply (after the war the surplus of monetary funds was taken away during the course of the monetary reform of 1947).

As follows from the table presented above, the proportion of the consumption fund in the utilized national income also decreased as compared to prewar years. Here the resources for accumulation were expended almost exclusively for the extremely critical needs of the military and heavy industry. It was necessary to use a minimum amount of funds for the reproduction of fixed capital in light industry, agriculture, transportation and communication, housing construction and the sphere of services for the population. Of all the industrial capital investments only 7 percent were spent in the consumer goods industry.<sup>26</sup>

The shortage of resources for accumulation made it impossible to make up for the losses of fixed production capital in industry caused by military losses and physical wear and tear. Thus in 1945 the value of this capital amounted to 95 percent of the 1940 level.<sup>27</sup> Other branches of material production--agriculture, construction, transportation and communications--did not have the capability on any large scale to replace the fixed production capital that had been eliminated. Agriculture sustained more than direct losses in the production apparatus as a result of its physical destruction: thus the rear regions in 1941-1942 transferred to the armed forces 32.6 percent of all mechanical power capacities that were being used in agriculture.<sup>28</sup> The arrival of new implements of labor from industry almost ceased. As a result, the value of fixed production capital in agriculture (including livestock) had decreased by 31 percent in 1945 as compared to 1940.

It was necessary to sharply reduce the deliveries of means of labor and materials to transportation. Thus in 1942-1944 rail transportation received 36.1 percent less ferrous metals, and one-third the amount of new rails received during the prewar year of 1940. The deliveries of new steam engines from USSR industry during 1942-1945 decreased to almost one-tenth the amount delivered in 1940, and cargo cars (biaxial)--to one-twenty-ninth the previous number.<sup>29</sup> Therefore transportation was operating under extreme strain during the war period and frequently could not handle the emergency shipments. Interruptions in the work of the railroads even forced them to postpone the time periods for the largest offensive operations on the part of the Soviet

army.<sup>30</sup> Periodically, because of the lack of railroad cars, in many sections of the network it was necessary to halt the loadings of many kinds of products.

The war conditions changed the structure of the utilization of the current output of the national economy: for military consumption they used 57-58 percent of the national income (in 1940--15 percent), 65-68 percent of the output from industry (25 percent in 1940), 24 percent of the agricultural output (in 1940--9 percent), and up to 50 percent of the capital investments (in 1940--one-third). The proportion of military shipments exceeded 60 percent (in 1940--16 percent).<sup>31</sup> There arose a special type of reproduction which was characterized by preferential diversion of resources into the sphere of military consumption, which almost without reimbursement removed from further circulation production capital and some of the national wealth and labor force.

What means and methods compensated, even if not completely, for this immense reduction of resources for production, under whose conditions the Soviet people managed not only to create a military economy, but also to provide for its growth, a sharp increase in production for the front and a rise in the level of consumption of the population in the second stage of the war?

#### Sources of Economic Success

The traditional extensive factors for increasing industrial output (enlisting additional labor force in production, starting up new production capacities) under the unusual conditions of economic development could only be utilized to a limited degree. There were also strong obstacles standing in the way of the utilization of intensive factors and, consequently, increasing production volumes as a result of economical expenditure of labor force, implements and means of labor. Therefore one can justifiably assign one of the leading positions to the self-sacrificing labor and the ability to work for a long period of time in the situation of self-denial of the customary goods in life, patiently withstanding deprivation and inconvenience under conditions of severe labor and executive discipline. It is equally correct to give a high evaluation to the significance of such factors as the ability to manage production collectives, to find correct planning decisions and so forth.

The reduction of labor resources employed in industry and other branches of the public economy was compensated for by an increase in the supply of working time; mass enlistment in production of women employed in the sphere of private labor and also adolescents and pensioners; an increase in the average output; a decisive reduction of management personnel, and so forth. In 1941 the number of workers and employees in industry had decreased by 23 percent as compared to 1940 but the number of man-hours worked remained the same: mandatory overtime work was introduced (lasting from 1 to 3 hours) and the regular and additional vacations were abolished. The proportion of women in the overall number of workers and employees in industry increased during the war years (on an average for the period) to 52-53 percent. As much as possible it was necessary to take such an extra-economic measure of attracting people to work in the public economy as mobilization of the able-bodied population that was not employed in it. About 1 million of these people were



sent to the main base branches of heavy industry--the fuel industry, electric energy, ferrous and nonferrous metallurgy, and about a half million were sent into the military industry.<sup>32</sup>

The critical shortage of labor force caused the Soviet state even to temporarily reduce the age limit for workers from 16 to 14 years (the length of the work day for adolescents was limited to 6 hours). The proportion of youth under 18 years of age in the overall number of workers and employees in industry increased from 6 percent in 1939 to 15 percent in 1942.<sup>33</sup>

Naturally, the mass replacement of experienced workers who had been called into the armed forces with less skilled ones or personnel who were not trained at all considerably reduced the overall skill level of the workers and employees industry. This was partially made up for by the occupational training of young workers in schools of the systems for labor reserves: during 1941-1945 they graduated 2,480,000 workers.<sup>34</sup>

In 1942 95 percent of all adolescents and 96 percent of the aged and ill were working on kolkhozes. Little more than 25 percent of the prewar number of able-bodied men were remaining on the kolkhozes in 1944.<sup>35</sup>

The mass introduction of flow-line production in the military industry, the intensification of production processes, the extensive development of socialist competition and the labor heroism stimulated the growth of labor productivity. In addition to this, in many sections of production the labor became considerably more difficult. As a result, the output per one worker in industry as compared to 1940 increased in 1942 by 30 percent, 1943--by 39 percent, and 1944--by 42 percent.<sup>36</sup>

The flow-line method of production, which had been widely used previously in a number of branches of industry, was introduced into other branches during the war period, including into the defense branches. It provided for increasing the output of products as a result of better utilization of equipment and production areas and reduction of the duration of the production cycle, and also a decrease in production costs. For the first time in world practice it was applied in the manufacture of heavy tanks weighing up to 50 tons.<sup>37</sup> The introduction of the flow-line method at aircraft plants in 1943 made it possible to increase the output of products per worker by 20-25 percent.<sup>38</sup> It provided for the rhythmic operation of enterprises.

An essential effect was produced by savings on material expenditures, which made it possible to obtain additional products. Thus in wartime machine building the norms for the expenditure of metal for the manufacture of the most important kinds of products during 1941-1944 decreased by 30-35 percent and more.<sup>39</sup> For purposes of economical expenditure of material resources technological processes were improved, normatives for material expenditures were made more severe, and kinds of raw materials and fuel that were in short supply were replaced by substitutes that were more available. Because of this it was necessary to reduce the requirements for the technical specifications and the standards for the products.

The improvement of technical equipment and the organization of production and the consistent course toward economizing on material expenditures made it possible to achieve considerable reduction in the initial outlays in the production of many kinds of products. For example, a reduction by 53 percent of the cost of manufacture of a heavy tank at the Chelyabinsk plant produced an overall savings during the years of the war in an amount of 2.5 billion rubles.<sup>40</sup>

During the war years there was a sharp increase in the "price" of time: everything had to be done in extremely short periods of time. In many situations "drawing out" these periods could have irreversible consequences of a noneconomic nature. It was necessary to proceed toward lightweight construction, refraining from constructing many capital facilities of the auxiliary economy and the production and social-domestic infrastructure, postponing their construction and replacing them with temporary simplified devices.

High-speed work methods became widespread in many spheres of activity. Thus before the war new models of artillery equipment were assimilated within 1-2 years while during the war this took from 1-3 months.

Successful organization of interconnected work produced a time advantage. Here, for example, is how things were arranged when preparing for the production of new kinds of tanks in Chelyabinsk. Participants in the events that are being described discuss this: the plant director and the people's commissar of the USSR tank industry, P. M. Zal'tsman, the assistant director and then assistant head engineer of the plant, G. Ye. Edel'gauz: "...Next to the designer work the metallurgist, the forge operator, the foundry workers, the stamping machine operator, the technologist for mechanical processing and assembly, and the instrument operator. The work proceeded not sequentially, but practically in parallel. When the development of the design was completed the technology was all ready and all that was left was to put the machine into production. And the stamps of the technologists necessarily appeared on each blueprint for a new machine. All this provided for good technology of the design and made it possible to fully take into account the actual technical and personnel capabilities of the plant and thus assimilate the new items more rapidly."<sup>41</sup>

In unprecedentedly short periods of time they constructed the Akchatau Tungsten Combine in Kazakhstan and the molybdenum mine with an enriching factory.<sup>42</sup> At the Magnitogorsk Metallurgical Combine two extremely large blast furnaces were constructed and put into operation in 6 months. The period for the construction and the startup of the most important facilities of the military economy were reduced to one-half to one-third the peacetime periods.<sup>43</sup>

Two stages stand out clearly in the development of the USSR national economy during the years of the Great Patriotic War. In the first of these (1941-1942) during the formation of the military economy the mobilization of all the country's resources for the needs of defense was accompanied by an overall decline in production. The second stage, which encompasses 1943-1945, was marked by surmounting the previous critical situations; a solid basis was provided for the military economy. The resources that were drawn into



national economic circulation turned out to be sufficient not only to achieve decisive superiority over Hitler's Germany in terms of the quantity and quality of arms, but also to begin restoration work in the regions that had been liberated from the aggressors and toward the end of the war to transfer some of the funds to peacetime reconstruction of the economy.

The desperate attempt on the part of fascist Germany to catch up with the USSR in terms of its rates of development of military production and the amounts of supply for the armed forces turned out to be unsuccessful. Hitler's men did not have sufficient resources for this. By the admission of Hitler's minister of armament, Speer, Germany had lost the war from the standpoint of the possibilities of its economic potential as early as the summer of 1944. The German military economy began to decline at that time. The index of arms production, which amounted to 322 in July of 1944, had dropped to 268 in November of that same year, and in March of 1945--to 145 (the 1940-1941 level was taken as 100).<sup>44</sup> Other branches of the German economy also began to deteriorate rapidly. Capital investments in the German economy during 1943 decreased (as compared to 1942) by 13 percent, and during 1944--by another 9 percent.<sup>45</sup>

As opposed to this, in the Soviet Union, industry, agriculture, transportation and construction increased their volumes of output during 1943-1945. In 1944 in terms of the output of the gross product, industry exceeded the 1940 level. In 1945 the volume of output decreased since after the victory over fascist Germany there was no longer a need to increase the output of military equipment and there began a changeover of the enterprises from military production to civilian production, which required a certain amount of time. The volume of capital investments in the economy during 1943-1945 increased from year to year.<sup>46</sup> During 1943-1945 the produced national income of the USSR increased by 25 percent.

All this was a clear manifestation of the immense viability of the socialist economy of the USSR and a result of the titanic efforts of the Soviet people.

#### FOOTNOTES

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3. Ibid., op. 41, d. 473, l. 6.
4. TsGANKh, f. 4372, op. 41, d. 473, l. 6; op. 38; d. 252; l. 22.
5. Ibid.
6. TsGANKh, f. 4372, op. 38, d. 251, l. 16; d. 252, l. 17; "The State Plan for the Development of the USSR National Economy for 1941," Moscow, Gosplanizdat, 1941, p 9.

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#### FORMER MEMBER RECALLS USSR GOSPLAN

Novosibirsk EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA (EKO) in Russian No 5, May 85 pp 19-24

[Article by A. P. Kovalev, personal pensioner, former deputy chairman of the USSR Gosplan, from a collection of reminiscences of USSR Gosplan workers prepared for press by N. I. Moskovkin and N. I. Zaprudskiy: "In the Gosplan at That Memorable Time"]

[Text] During the war years USSR Gosplan workers, like all Soviet people, worked extremely hard. High discipline, the strictest responsibility for the matters entrusted to them, a readiness not to think about time in order to fulfill the assignment on time, and priority for statewide interests--these qualities were inherent to a high degree in workers of that time.

One must say that these qualities were instilled even during peacetime. One recalls the following episode. When establishing the plan for the production of grain combines for 1936 the machine-building division of the USSR Gosplan and the Glavsel'mash of the corresponding people's commissariat adopted the figure of 12,000 units. At my suggestion the agricultural division of the USSR Gosplan insisted on 16,000. By that time the Rostsel'mash Combine plant had gathered speed in production and was confident that it could carry out a larger program than the one earmarked by the Glavsel'mash. The dispute reached the party Central Committee where they carefully considered the arguments of the two sides and, on the basis of the opinions of plant workers, set the plan in the amount of 18,000.

In the party buro the chief of the machine-building division was given a reprimand for establishing a plan that was too easy. And the buro of the Komsomol cell (at that time I was a Komsomol member), in spite of the fact that I had defended the figure of 16,000 and had not agreed to 12,000, singled me out for inadequate substantiation and failure to manifest persistence when working on this issue, that is, for the fact that I had not drawn the attention of the management to it. This was a good lesson for me. This case shows also how strictly the party organization of the USSR Gosplan reacted to omissions in the work of communists, instilling in them a principled, party approach to solving state problems.



At the beginning of the war the collective of the USSR Gosplan began to carry out complicated and responsible assignments for the party Central Committee and the government. Instead of small sectors they formed divisions for ammunition, arms, aviation, tanks and self-propelled weapons, shipbuilding, and military and naval supply; the loads on workers of other divisions were redistributed and increased because some of the workers went into the army and the militia.

In spite of the difficult experiences of the first months of the war and the forced evacuation of the USSR Gosplan staff to Kuybyshev, its collective worked with immense energy on searching for resources and increasing the economic potential for victory. The planning of the national economy was changed over to quarterly and monthly periods, and for certain kinds of military equipment and decisive raw material resources and items--to 5-day and even daily schedules for the output of products. They used fairly extensively the centralized planning of the output of the prepared items and established a schedule for starting up the production of the decisive elements of military equipment. This practice was applied when drawing up the plans for the production of aircraft, tanks and especially ammunition. Daily control over the course of production and the deliveries of raw materials, processed materials and batching items created conditions for efficient fulfillment of the plans. Along with the general plans for production for each kind of military equipment and for each ministry, plans were developed for the main plants with an appendix containing the plan for their material and technical support in a broad range of products. Operational regulation was used for the delivery of raw materials, processed materials and batching items by the corresponding division of the defense industry of the USSR Gosplan. In the divisions for ammunitions and tanks the workers checked daily on the movement on the railroad of cars containing raw materials, processed materials and especially batching items from the supply plants to the consumer plants.

When calculating the need at the plants that produce military equipment they envisioned the supplies of raw materials, processed materials and batching items as well as accelerated deliveries of material resources. As a rule, the monthly norms for the deliveries of raw materials, processed materials and batching items were determined by decision of the government in amounts of 40 percent during the first and second 10-day periods and the full monthly norms were set for no later than the 25th of each month. These instructions were carefully fulfilled by the suppliers. The producers of military equipment extensively enlisted small enterprises to help in the manufacture of elements of their own products, particularly enterprises of local industry and industrial cooperation. The necessary volumes of raw and processed materials for them were envisioned in the plant plans for material and technical supply.

The USSR Gosplan created strict system of control over the fulfillment of production plans not only for military equipment, but also for the main kinds of raw materials, processed materials and batching items which provide for the output of military equipment. Special attention was devoted to ferrous and nonferrous metals, fuel and explosives. The corresponding divisions each day received data concerning the fulfillment of the output plan from the people's commissariats not only as a whole, but also for the main enterprises. These

data were also submitted each day to the management of the USSR Gosplan. At the same time they reported on measures for eliminating difficulties.

The limited amounts of resources made it necessary to use all raw materials, processed materials, fuel and electric power mainly for the production of defense products, to constantly look for reserves and to introduce on a large scale various substitutes for materials that were in short supply. At the Plant imeni I. A. Likhachev for Producing Trucks they used waste metals from enterprises that produce defense products--aircraft engines, ammunition, tanks and so forth, for the cabs they used ordinary plywood, and the bodies were made of wood. In spite of their "noncommercial" appearance, these trucks were quite able to handle the shipments. For producing U-2 aircraft they used fabric which had been treated with the appropriate chemicals and aircraft coating. During the first days of the war the infantry was armed with bottles filled with a combustible mixture which made it possible to weaken the enemy's tank attacks somewhat.

More than 10,000 tons of blank shells were shipped to one of the plants which completed the assembly of equipment for the production of shells. But when they were tested it turned out that the blanks could not be used because of their sizes. Since the metal had been included in the regular plans in the production of shells, there was a threat of interrupting the production of products. Because of the lack of reserves it was impossible to replace this metal. The metal had been included in the supply plan at my suggestion. On instructions from N. A. Voznesenskiy I immediately went to the plant where for 2 days along with the technical personnel, masters and workers in the stamping shop we search for possibilities of utilizing the metal that had been received for its immediate purpose. To our great happiness we managed to do this. One of the old workers and a young engineer (I do not remember their names) designed a special adapter for the stamp press and thus saved the metal which was so costly at that time. There was no time to investigate and find out who had made the mistake in ordering metal that did not meet the technical specifications, and the guilty party was never discovered.

At the beginning of 1942 it became difficult to supply the front with cartridges for machine guns and automatic rifles. The evacuated plants for producing the cartridges and the brass strips had not completed the assembly, and certain equipment was still en route to the location of the new enterprises. The USSR Gosplan in conjunction with the people's commissariats for armament and ferrous metallurgy were given 2 weeks to arrange the output of cartridges of the corresponding sizes. During this time, without ever leaving the Gosplan building, we and the representatives of these people's commissariats took on-the-spot measures to move carloads of equipment and raw materials and gave urgent instructions to the plants for readjusting machine tools for rolled brass strips and for accelerated production of cartridges and their dispatch to the front.

The enemy was breaking through to Donbass. The metallurgical plants were disassembled in a hurry. The Yuzhnotrubnyy plant had also begun to disassemble its equipment. The production of reactive cartridges for the Katyusha with the latest design, whose blueprints had not even been completed yet, required a large quantity of pipe, but the sizes of the pipe blanks were

not determined for a long time. A threatening situation was created. Finally the blueprints were completed and the sizes were established. I telephoned the chief of Glavmetallobyt with the figures on the sizes and asked him to transmit them immediately to the Yuzhnotrubby plant so that they could roll the largest quantity of pipes immediately and send them in batches to Moscow to the metal base of Glavmetallobyt. As a result literally within a couple of days Moscow received more than 11,000 tons of pipes, which made it possible to provide for the production of Katyushaf for many months in the central regions of the country before the pipes arrived from the Urals. Such responsible decisions were frequently made on the telephone. There were no cases of failure to fulfill any assignments for providing for the production of defense equipment which came from the Gosplan.

Sometimes it was necessary to intervene in the course of the production of items for the front. At the beginning of the war the government began to receive alarm signals concerning the lack of cartridge belts at enterprises that manufacture cartridges. N. V. Voznesenskiy instructed me, in conjunction with the chief of Glavsvetmetobrabotka, to take an emergency trip to one of the plants and immediately eliminate the difficulty. The bottleneck turned out to be the last operation--the control of the belts, which was provided by representatives of the People's Commissariat for Defense. Along with plant workers and representatives of this people's commissariat we came to the conclusion that it would be expedient to organize control not at the final operation, but throughout the entire technological line, stationing controllers all along it. As a result the output of products increased sharply. Moreover, the sales division revised the schedule for the delivery of products to the consumer plants. It turned out that there were many enterprises that were receiving a reduced quantity of belts and the production of cartridges at them had been held up.

There were also unpleasant incidents. At the beginning of 1942 it was planned to produce a large quantity of armor-piercing cartridges. The metallurgical plants received increased plans for the production of blank cartridges and some of the metal was purchased abroad. The People's Commissariat for Foreign Trade notified the USSR Gosplan that it would arrive in port at the beginning of January 1942. This also served as a reason for including it in the plan for provisions for the first quarter of 1942. It soon became clear, however, that the transportation carrying the 10,000 tons of metal had sunk. It was necessary to immediately increase the plans for the production of blanks at domestic plants using other kinds of rolled metal, and the chairman of the Gosplan was instructed to investigate and severely punish the parties guilty of including imported metal in the plan for providing for the production of ammunition before it had arrived in port. The documents showed that the People's Commissariat of Foreign Trade had submitted its notification days before the arrival of the transportation, but it had sunk right outside of port. And although nobody was punished this incident served as a good lesson: the draft of the plan must be feasible!

During those years I had occasion to meet with state figures regarding many issues which were being handled by the USSR Gosplan. The most frequent meetings were with A. I. Mikoyan. During the Great Patriotic War and the postwar period the government instructed him to check on the balances and the

plans for the distribution of raw materials, processed materials and equipment for the planning year. I, as head of the Consolidated Division for Material Balances, was always having to substantiate the drafts of the plan for the distribution of products in A. I. Mikoyan's commission.

But when considering the balances and plans for the distribution of metal for 1947 I was instructed to study the complaints from the ministries and within 3 days report on the necessary corrections. With each minister I had to review all the complaints that had been submitted to the commissions and carefully check the calculations, after which I was convinced that our planners were right and there was no reason to make changes although, of course, it was difficult to provide resources for the production plan. There were many disputes, right down to accusations that our planners would undermine the production plans and that the USSR Gosplan was underestimating the importance of one branch or another. I was attacked especially energetically by the minister of nonferrous metallurgy, with whom the matter descended to mutual unpleasant reproaches. After 3 days, when announcing the results to A. I. Mikoyan, I was very nervous--for I had not suggested a single correction for a single ministry. Having heard me, A. I. Mikoyan asked whether I had seen the ministers and considered all the complaints and then he approved my suggestion, explaining that if I had been too easy and given in to anybody he would have accused me of having departmental interests or playing favorites with them, which would have caused harm to the state approach to the matter.

All USSR Gosplan workers, beginning with the rank-and-file worker right up to the chairman and his deputies, sparing no efforts or time, did everything possible to produce a maximum quantity of products for the front.

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## FERROUS METALLURGY CONTRIBUTES TO WAR EFFORT

Novosibirsk EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA (EKO) in Russian No 5, May 85 pp 24-37

[Article by T. Mikhaylovskaya taken from book entitled "Steel for Victory" published under the aegis of the Soviet of Senior Metallurgists Under the USSR Ministry of Ferrous Metallurgy in the "Mysl'" Publishing House (Moscow, 1983, 263 pp, 14,000 copies). The collective of authors: V. S. Bychkov, S. N. Belorusev, N. I. Gorbachev, A. V. Mitrofanova, V. D. Romanov and V. N. Shapritskiy]]

### [Text] Ferrous Metallurgy During the War Years

On the eve of the war ferrous metallurgy had considerable capacities at its disposal. The majority of the enterprises had appeared during the 2nd and 3rd five-year plans and were equipped with modern, highly productive equipment. In the eastern part of the country a second coal and metallurgical base had been created along with the largest metallurgical combines--the Magnitogorsk and the Kuznetsk. The proportion coming from the Urals and Siberia increased although a large part of the products were still delivered from the South, as before (see Table 1).

Table 1--Regional Structure of Metal Production at Plants  
of Narkomchermet in 1940, % of Total

<u>Regions</u>	<u>Iron</u>	<u>Steel</u>	<u>Rolled Metal</u>
South	64	54	55
Ural	18.5	22	22
Siberia	10.5	14	13
Center	7	5	5
Volga	--	5	5

Complicated kinds of metal products had been assimilated during the prewar years. In the scientific research institutes and plant laboratories they created new grades of steel and developed the technology for their production. Advance foreign experience was also studied and borrowed.



The branch was restructured to work on orders. "Now we can no longer use whatever kind of steel we end up with. For a motor, a diesel engine or a domestic machine tool we need metal with particular properties and a particular quality, which are given in the order," wrote PRAVDA on 23 November 1940.

#### Evacuation

On the third day of the war, on 24 June, the Council for Evacuation was formed, and on 29 June the USSR Sovnarkom and the Central Committee of the VKP(b) [All-Russian Communist Party (of Bolsheviks)] adopted a directive concerning the mobilization of all forces and funds for routing the fascist oppressors. Metal was necessary at the front and therefore the plants worked to the extent of their capabilities. It was permitted for them to halt and disassemble the equipment only by an order from an authorized GKO or people's commissariat.

From the memoirs of the chief of the Main Administration for Capital Construction (GUKS) of the People's Commissariat for Ferrous Metallurgy, V. B. Khlebnikov:

"In July-August the GUKS became the staff for relocating southern metallurgy to the east. The proposals prepared in the staff in conjunction with planning organizations and main boards were reported to the people's commissar, I. S. Tevosyan weekly at first and then even daily. The leaders of the people's commissariat studied them, and coordinated them on the telephone with the directors of the enterprises that were being evacuated and those that were receiving them, as well as the secretaries of the party obkoms. Then we prepared a draft of the decree of the GKO which was submitted for consideration on that same day. The decisions of the GKO were accepted immediately. Special attention was devoted to the most rapid restoration and startup of the shops. The foundations and underground mains, the rafters of the buildings and the sheds were prepared before the equipment arrived."

The conditions for the evacuation varied in various regions, but all of the enterprises were limited to short periods of time. Frequently the disassembly, the evacuation and also the operation of the main shops took place under bombings, under the threat of having the territory of the city be taken over by the fascists or having the movement blocked.

The largest ferrous metallurgy industry in the south--the Plant imeni Dzerzhinskiy in Dneprodzerzhinsk--was evacuated in 8 days: the disassembly of the equipment began on 8 August and the last trainload of it left on the 16th. A total of 1,359 cars were dispatched: 675 with equipment, 462 with materials and prepared products and 222 with people. At this plant during the first five-year plans they had done an immense amount of work for expansion and reconstruction of production and only recently had installed a universal machine tool purchased in England, and this had to be destroyed.

The Pipe-Rolling Plant imeni K. Libknekht on the right bank of the Dnepr was operating at full force while the other right bank enterprises were being

evacuated. The permission for its evacuation did not come until 18 August, when the enemy was already close at hand.

The evacuation of the Novomoskovsk tin-plating plant (27 kilometers from Dnepropetrovsk) was to have been completed on 26 September, but the Germans broke through to its territory on that day. They took the head engineer Tseytlin who was in charge of the evacuation and shot him on the spot.

The renowned steel smelter of the Plant imeni Il'ich, Makar Mazay, died in Mariupol. During the first days of the war he returned to the plant from Moscow where he had completed training at the industrial academy and began to work as the shift boss. When Hitler's troops arrive he went underground. A traitor turned him in.

The equipment at Zaporozhstal' was disassembled and dispatched under fire, under conditions of mortal danger. Since 18 August the enemy had been firing on the highway that led to the plant, the railroad tracks, the high-voltage electric power transmission line and the tall plant structures. Mines and cartridges had fallen on the territory of the blast and Marten furnace shop. From 20 August through 3 September the Zaporozhstal' workers loaded 9,600 cars. All of the cargo that had been shipped weighed about 230,000 tons. The documentation took up 1,235 sheets, but such detailed accounting made it possible to restore the plant quickly after Hitler's troops had been driven out. The last carload of people (700 workers and their families) left on the only open railroad at the time, Zaporozhye-Pologi, a couple of minutes before the bridges were to be blown up. The Soviet fighting men held the Germans to the right bank of the Dnepr for 46 days. The evacuation of Zaporozhstal' lasted 45 days.

Enterprises of the Donbass ended up with considerably less time.

One of the episodes of the evacuation of the Stalinskiy metallurgical plant is related by the chief of its financial division, F. I. Chuyev:

"After the announcement of the order to curtail the plant's activity we obtained money from the Gosbank to pay off the workers. The financial workers spent 2 days paying wages, but they did not manage to finish. I spent 2 weeks making my way to the Krasnyy Oktyabr' Plant with a sack full of the leftover money (about a million rubles) and without any protection. En route I issued the money to our workers. One night in the light of a campfire I issued 70,000 rubles to the director of Azovstal' to settle accounts with the Azovstal' workers who had left the plant when the Germans had already taken Mariupol."

By the end of 1941 there remained one metallurgical plant in operation in the southeastern part of the country--Krasnyy Oktyabr' in Stalingrad. It became one of the main goals of the immense campaign. We managed to evacuate--and then only partially--only the reserve equipment and certain materials. The enemy completely destroyed 170,000 square meters of production space, transportation and crane equipment, and mechanical and electrical equipment. The commission of Glavspetsstal' estimated the damage at 600 million rubles.

From July through October we evacuated 19 large metallurgical plants, 16 plants for high-quality steels, nine pipe-rolling plants, seven metalware plants, 19 coke and chemical plants, eight extremely large ore administrations, 21 enterprises of the refractory materials industry, and five ore administrations for extracting nonore materials. Soon after arriving at its destination the powerful and costly equipment began to produce products, but there was much that had to be completed and installed in the new shops and even plants, and some of it waited in the warehouses to be returned.

#### Eastern Metallurgy--Support for the Front

At the end of June 1941 the government approved a list of the most important construction projects for ferrous metallurgy in the Urals and Siberia. The construction of metallurgy enterprises, their supply with materials, equipment and food, and the assignment of personnel to them were placed on a par with measures for especially important defense purposes. All of the people's commissariats were obligated first of all to fill orders for ferrous metallurgy and report on this to the GKO twice a month.

Increasing the output of products at existing enterprises was an important aspect. The responsibility for the output of high-quality metallurgical products lay primarily on the Magnitogorsk and Kuznetsk combines.

Before the war the Magnitogorsk Combine produced 88 percent of the ordinary grades of steel and only 12 percent of the high-quality grades. During peacetime it seemed quite improbable that they would be smelting structural metal from military equipment in the large Marten furnaces which could be found in Magnitka and Kuznetsk. The Leningrad specialists who were sent to the MMK [Magnitogorsk Metallurgical Combine] recommended that a duplex process be used. But it led to a sharp reduction in the productivity of the Marten furnace shops. The steel smelters of the combine suggested smelting armor metal under ordinary conditions. After carefully working out the technology, with strict observance of the heat and slag conditions, in September 1941 in the Marten furnaces of the MMK they smelted armor steel which met all the requirements for military use. This was a large victory!

But there was no point in rolling the armor plating at the combine. They waited for the thick-sheet armor rolling mill which had been evacuated from the Mariupol Plant imeni Il'ich. The plant prepared to accept the equipment. All technological personnel developed variants for installing it, but it turned out that anywhere the plant would impede the normal course of production and its installation would take too much time. What decision did they adopt? In the very heat of the argument in the director's office the deputy head mechanic, N. A. Ryzhenko, suggested a bold idea--to roll the armor sheets on a blooming mill! Everyone was impressed. But would the blooming mill be able to handle the rolling of ingots with high durability? They calculated the load on the main components and these calculations showed that with cautious operation the blooming mill would not break down. There was a risk, but the people's commissariat permitted an experimental rolling. Everything turned out all right. For the first time armor metal was obtained on a blooming mill. The Magnitogorsk armor plating arrived at the tank plants 1.5 months ahead of the deadline established by the government.



At the same time foundations were constructed for the heating furnaces and the auxiliary devices for the equipment from Mariupol. The earth-moving work was done under pouring rains, and groundwaters were found at a depth of 5.5 meters. For 2 weeks the people pumped water 24 hours a day, reinforced the slopes which were sliding away and hauled out the mud. They lived next to the construction site in tents. Because of the shortage of working hands it was frequently necessary to work for 20 hours without relief. Working in parallel with the builders were the planners, who did not have sufficient technical data concerning the evacuated equipment. There was no time for blueprints. The builders worked from sketches. The majority of the work involved a serious risk. For example, the armor mill was installed with the help of a gantry crane with a lifting capacity of 50 tons (the mill weighed 90 tons). On 15 October 1941 the shop went into operation. From the machine tool they received sheets of armor plating that were up to 4,100 millimeters wide, and from the blooming mill--up to 2,100 millimeters. In parallel they constructed a thermal shop for processing the armor plating sheets and they constructed seven roasting furnaces with sliding soles. Both shops were put into operation in only 2.5 months!

During this same time they moved 32,000 cubic meters of earth, laid 13,000 cubic meters of concrete and reinforced concrete, installed about 3,000 tons of metal structures and 4,000 tons of equipment, and laid 11,000 cubic meters of brick inserts. In October 1941 the MMK produced 3 times as much metal as it did in August, and in December--7 times as much.

The equipment from 34 evacuated plants was located on the sites of the Magnitogorsk Combine. It was installed in the operating shops or new ones were constructed, and certain enterprises were restored as independent ones. As a result of the radical restructuring of production and the high-speed construction of new facilities using the evacuated equipment, the output of high-quality metal at the combine increased eightfold during the war years, including for cartridges--5.5-fold. More than 50,000 tanks and every third cartridge were manufactured from armor metal from Magnitogorsk.

Old Ural plants also received equipment from the evacuated enterprises: the Chusov, Zlatoust, Nizhnyy Tagil, Serov and others. By June 1941 only certain of them were hooked up to the networks of the Ural energy system. But the majority of them had their own small electric energy stations which were operating at their limits and the boilers were filled with unpurified water. The weak fans (many of the blast furnaces were still operating on brown coal) made it difficult to use coke for smelting iron. Even by the autumn of 1941 there was a critical shortage of electric energy and fuel. They began to search for local resources: gas coals, wood, peat and rock coal resins accumulated in the dumps. The technical reequipment of these plants was basically completed by 1943, which made it possible to increase the output of alloy and special grades of steels to 35 percent of the overall products they produced.

The construction of new enterprises: along with the expansion and reconstruction of existing plants, new enterprises were rapidly being



constructed in the eastern part of the country. A large load fell on Chelyabinsk Oblast.

The expansion and new organization in the East of the production of cold rolled thin-walled pipes for aircraft, cold rolled sheet steel, forced pieces for aircraft engine construction and metalwares became one of the primary tasks in 1941. In August an order was received to evacuate the equipment from the block of shops of 'Elektrostal' in the village of Chebarkul in Chelyabinsk Oblast, where it was intended to construct a new plant for aircraft forged pieces. Only 2.5 months were allotted for its construction (seven production and 11 auxiliary shops). The construction, which was of primary significance for defense, was strictly controlled by the Central Committee and the government. The destiny of the construction project was decided by the month or even by the day, but each hour.

By a decision of the government, the people's commissar of construction, the deputy people's commissar of ferrous metallurgy, the deputy people's commissar of heavy machine building and the chief of Glavchermetstroy remained continuously at the construction site until it was completed. Their presence at the construction site and the close cooperation between the planners and the builders made it possible to solve complicated problems on the spot, ones which would take weeks or even months during peacetime. Such a policy was widely used at the key facilities.

...According to the schedule the laying of concrete in the shop was to have been completed in 5 days. This required four trucks and there were only two. Then the drivers Chemodanov and Ponomarenko decided to make 42 trips a shift instead of 25 (the norm). As a result, in spite of the 40-degree-below-zero weather, the concrete did not freeze en route and the concrete workers were able to fulfill five norms each per shift. The work was completed in 3 days.

They were continuously building, day and night. The plant produced its first products precisely on time. "Chebarkul was indeed a 'firing line' of the Patriotic War, even though it was located deep in the rear," wrote the former first secretary of the Chelyabinsk Obkom and Gorkom of the VKP(b), N. S. Patolichev.

Another page in the history of great accomplishments during those terrible years was the construction of the Chelyabinsk Metallurgical Plant. "This might sound paradoxical, but even now, during days of peaceful construction, with immeasurably better supply and higher mechanization of work, it is very difficult in such short periods of time to start from the beginning and create a complex of metallurgical shops that actually produce high-quality products. Even today one gets a lump in one's throat when one recalls the days when the first trainloads of Chelyabinsk steel were sent to the tank plant, the meetings in the shops filled with the fervent patriotism in the speech of the workers and engineers," writes the chief of Chelyabmetallurgstroy and later deputy minister of defense of the USSR, A. N. Komarovskiy, in his memoirs.

The Chelyabinsk pipe-rolling plant, the Novosibirsk Metallurgical Plant, the Kuznetsk and Oktyubinsk ferrous alloy plants and Amurstal' continue the list of examples of extremely great organization and self-sacrifice on the part of

the Soviet people when constructing new enterprises in the eastern part of the country. This region confidently increased the volumes of production of this vitally important product (see Table 2).

Table 2--Production of Iron, Steel and Rolled Metal in Urals and Siberia, Millions of Tons

	<u>1940</u>	<u>1941</u>	<u>1942</u>	<u>1943</u>	<u>1944</u>	<u>1945</u>	<u>1950</u>
Iron	4.2	5.1	4.6	5.3	6.2	6.7	9.1
Steel	5.1	6.0	5.7	6.2	7.3	7.9	12.9
Rolled metal	3.8	4.4	4.1	4.6	5.4	5.9	10.2

#### Ore and Scrap Metal

Among the multitude of tasks that arose for metallurgists with the beginning of the war, perhaps the most complicated and important was the problem of manganese ore. Manganese removes oxygen and sulphur from the smelted steel. No replacement has been found for it so far. In 1940 35 percent of all the manganese ore was produced by the Nikopol deposit in the Dnepr area, 56 percent--the Chitatur in Georgia, and 9 percent--in the eastern part of the country. Within a month and a half after the beginning of the war the Nikopol mines, like the Krivoy Rog iron ore mines, were put out of operation. And again the extraction of ore from existing deposits in the Urals and Siberia was increased in the shortest possible periods of time and new deposits were assimilated--the Polunochnyy mine in the Northern Urals (August 1941) and the Dzhezdinskiy in Kazakhstan (June 1942).

The Krivoy Rog miners rendered invaluable assistance. In particular, the method proposed by the eminent driller from Krivoy Rog, A. I. Semivolos, rapidly became widespread. In 1943 Semivolos fulfilled the norm by an average of 800 percent ("Some fought with arms and others with punch cards").

Increasing the expenditure of scrap metal in blast and Marten furnaces became one of the most available means of increasing the smelting of metal. Because of the occupation of the Ukraine, Belorussia and the western oblasts, the procurements of scrap metal decreased: in 1941--5 million tons and in 1942--3.4 million. "The GKO demands that the people's commissariats personally provide for unconditional fulfillment of the plan for the delivery of scrap metal. Representatives of the ispolkoms also bear personal responsibility. Each oblast has a firm plan for delivering scrap metal. It must be fulfilled just as the plan for grain is. It is necessary to enlist the Komsomol, school children and all the population in the gathering of scrap metal," wrote PRAVDA on 15 March 1942.

At the beginning of 1942 there arose a problem: processing the damaged military equipment which was arriving at plants of Vtorchermet in large quantities. There were not enough powerful lifting devices or areas for stacking it, and because of the bulkiness of the smashed tanks, aircraft and so forth, the capacities of the railroad cars were not utilized sufficiently. The railroads could not keep up with the load and many railroad cars with scrap metal from the zone near the front piled up in the central regions of

the country. By September 1943 15 bases were organized here for receiving and separating military scrap metal, with an annual capacity of 750,000 tons. They were created near the population points that had railroads. The bases were equipped with moving trains, tractors, steam engines, motorized engines and other technical equipment. Each base was staffed with 150-200 workers who settled nearby and were provided with food.

Authorized GKO's were established for collecting, processing and dispatching scrap metal in the various oblasts, krais and autonomous republics. They checked on the fulfillment of the plans by each enterprise and did not allow the railroad cars to stand idle. During 1942 front and rear organizations dispatched 816,000 tons of damaged military equipment, and in 1943--about 2 million tons.

The use of metal supplements in the charges for the blast furnaces doubled on the average for 1945 as compared to 1940. The effect of the application of metal shavings is eloquently shown by these figures: the ordinary daily productivity of a blast furnace at the Kosogorsk metallurgical plant when working with ore amounted to 300 tons, and with the addition of metal shavings--800 tons.

#### Personnel

The losses at the beginning of the war, the evacuation and the departure of workers into the army essentially worsened the quantitative and qualitative composition of the personnel. Before the war there were 487,000 production workers in the branch. During the first 6 months of the war their number decreased to 184,000 (by 62 percent).

The military restructuring of the national economy required centralized redistribution of labor resources. Women, youth, pensioners and disabled people were extensively enlisted. Thus even in the mining industry, where previously female labor was used in extremely limited quantities, by the end of 1941 the proportion of women had reached 26.5 percent. Workers from light and the food industry and municipal services, employees from the administrative staff, people liable to be called into the service who were not fit for combat duty--a total of 136,000 people were sent to metallurgical enterprises in 1942, including 39,000 people who were liable for military duty. They were joined by about 40,000 graduates of FZO schools and trade schools.

As usual, there was a critical shortage of skilled workers. Here is only one of the many examples. Without skilled spring makers and pattern fitters there would be no possibility in the new place--the Sinarsk pipe-casting plant (Urals)--of arranging the output of the most important products--machine gun springs. The people's commissar I. F. Tevosyan was forced to go to the deputy chairman of the USSR SNK, A. N. Kosygin with a request that he immediately send workers from the Leningrad steel-smelting plant to the Urals. The party Central Committee, the SNK and the People's Commissariat of Defense rendered immediate assistance and gave priority to sending workers to the metallurgical enterprises.

Socialist competition revealed immense reserves.

Its special feature during the wartime was its efficiency. The results were summed up each month. For bonuses they allotted a monetary fund of 1 million rubles and a physical fund of 30,000 meals, 1,000 pairs of shoes, 500 woollen suits and so forth each month.

They used "military assignments" for maximum incentives for increasing labor productivity. The sheet of paper indicated briefly the content of the work, the composition of the brigade, the time period for the fulfillment of the assignment in shifts and hours, the sum of monetary bonuses according to a progressive scale and the list of physical bonuses in the form of additional food and coupons for industrial goods. Such "military assignments" were received by workers, foremen, advanced parties and supervisors in all of the decisive sections which limited the overall course of construction, particularly the Magnitostroy Trust.

Beginning in May 1943, in response to an appeal from the Kuznetsk metallurgists, competition was developed in the occupations not only of the leading, but also of the subsidiary shops and plant services. For example, at KMK and MMK the workers from more than 40 occupations competed, and at the Moscow Serp i Molot plant--from 50 occupations. The winners were awarded state prizes.

One of them, the KMK steel smelter A. Ya. Chalkov, relates this:

"With the beginning of the war the combine was given a militant task--in the shortest possible period of time to master the smelting of special alloy steels. Along with us steel smelters the engineers did not leave the furnaces for days. We completed a revolution in the technology of steel smelting! For 2 years I personally produced as much steel in excess of the plan as was needed to manufacture 24 heavy tanks, 36 machine guns, 15,000 mortars, 100,000 grenades and 18,000 automatic rifles."

#### The Rebirth of Metallurgy in the Northern and Central Parts of the Country

During the war they completely or partially destroyed 37 metallurgical plants and put out of commission 62 blast furnaces, 213 Marten furnaces, 248 rolling mills, 4,700 coke furnaces, 29 refractory material plants, and 18,000 mining enterprises which annually extracted more than 20 million tons of iron ore.

The first to be restored were the plants that did not suffer from the destruction (Serp i Molot, Elektrostal' and others) and also those that were located in the strip near the front or on the front and sustained damage (the plants of the Tula and Lipetsk groups, two metallurgical plants and three coke and chemical plants of the eastern part of the Donbass).

"The potential capabilities of southern metallurgy by the time the south was liberated could be expressed in amounts close to zero," wrote the deputy people's commissar of ferrous metallurgy, Academician I. P. Bardin. In a meeting of the People's Commissariat of Ferrous Metallurgy on 24 August 1944 they discussed in detail the plan for restoring it. A discussion developed:



should they restore the enterprises in their prewar form, which would reduce the time periods for the work, or should they carry out a large-scale modernization, replace the outdated technical equipment and destroy the old shops and create new ones. It was decided that in the plans for restoration they would envision the mechanization of labor-intensive processes and eliminate the previously existing disproportions between individual shops and productions.

And again the work was carried out in an extremely short period of time, bordering on the impossible. Thus while during the years of the 2nd Five-Year Plan the thin sheet rolling mill at Zaporozhstal' was installed in 1.5 years, with the restoration under the 4th Five-Year Plan it took 4 months. In the former case the equipment was new and assembled under plant conditions and did not require adjustments or fittings. In the latter case it needed to be adjusted and partially repaired, and some things had to be manufactured anew and fitted into position. And on the busiest days up to 13,000 workers and specialists from 15 organizations were working on the installation of this machine tool.

When restoring the shops for slabbing, thin sheet and cold rolling in this plant they made maximum use of old metal structures. Engineers of Stal'montazh Trust developed telescopic lifters, without which 40,000 tons of metal structures would have had to be transformed into scrap metal. The bays were raised up in blocks, each with 20 columns weighing about 1,000 tons. The block was separated with autogenic cutting. The disfigured columns were gradually straightened out and the beams and girders were put in place. They did not manage to restore all of the components, and those that could not be restored were replaced with new ones. The telescopic method made it possible to save 10 million rubles and no less than a year of valuable time. From June through October 1947 the plant put a new shop into operation each month. Within 2 years after the end of the war Zaporozhstal' was again producing sheet metal. The plant was fully restored in less than 5 years.

From 1945 through 1950 the Makeyevka metallurgical plant was being constructed. Shops were being reconstructed at the same time. The blooming mill which was restored by the end of 1946 was a highly mechanized set of equipment. Retained in the memory of the old rolling mill operators is the picture of the difficult and dirty collection of the cinders by hand, which damaged the health of the people. Now this operation has been mechanized. The Marten furnace shops have received modern furnace torching machines and unloading cranes, highly durable arches made of chrome magnesium brick have been installed in the furnaces, the cooling takes place with the evaporation of steam from the elements, and the regulation of the heating conditions for the smelting has been automated....

The plants of the northern and central parts of the country basically reached the prewar level of production of iron, steel and rolled metal between 1949 and 1950.

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## USSR ACADEMY OF SCIENCES DURING WAR YEARS DESCRIBED

Novosibirsk EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA (EKO) in Russian No 5, May 85 pp 38-45

[Article by B. V. Levshin, candidate of historical sciences, director of the Archives of the USSR Academy of Sciences (Moscow): "The USSR Academy of Sciences During 1941-1945"]

[Text] With the beginning of the war the ideas of the scientists turned toward all kinds of assistance for the front and toward the application of scientific discoveries in the interest of defense. "Almost every part of military equipment, uniforms, military materials, medications," wrote the president of the USSR Academy of Sciences Academician S. I. Vavilov, "all of it bore the imprint of preliminary scientific and technical thought and development."<sup>1</sup>

The most immediate tasks were earmarked even by July 1941: the development of problems directly related to defense; scientific and technical improvement of production; mobilization of raw material resources for defense needs.

The vice president of the USSR Academy of Sciences, Academician A. F. Ioffe noted that during the first months of the war there was not only a change in the subject matter of the work, 90-95 percent of which had been turned toward solving military problems, but the rates of research work were significantly stepped up. "Many of the work projects," he wrote, "were carried out not in laboratories..., but most frequently...directly under military conditions. Because of the nature of their work many of our associates had to participate in real combat actions...."<sup>2</sup>

The difficult task of leading the evacuation of the USSR Academy of Sciences lay on the shoulders of its vice president, Academician O. Yu. Schmidt, and the authorized council for evacuation for the Academy of Sciences.

The war displaced 35 scientific institutions of the USSR Academy of Sciences; 100 academicians and 128 corresponding members were evacuated. By the beginning of 1942 academic institutions were located in 45 points in the country. When in September 1941 the circle of the blockade was closed around Leningrad, a large number of academic institutions had remained there: the Astronomy Institute, the Main Observatory, the Botanical, Zoological and

Physiological institutes, the institutes of the History of Material Culture, Ethnography and others. Until the evacuation itself in February-July of 1942 they worked in the occupied city, carrying out assignments for the Leningrad Front.

Kazan became the largest center for academic science during the evacuation. There were 1,884 scientific associates of the Academy here, including 39 academicians and 44 corresponding members. Operational guidance of their activity was provided by the Kazan group of the Presidium of the USSR Academy of Sciences headed by Vice President A. A. Ioffe.

The Uralsk comprehensive expedition and the Ural branch of the Academy of Sciences in Sverdlovsk became the base for academic institutions in the Ural area. Certain people's commissariats and departmental scientific research institutes with which they immediately established ties were located here during the evacuation. There were 216 scientific associates and 35 academicians and corresponding members working in Sverdlovsk. The president of the Academy of Sciences, Academician V. L. Komarov, was located here too.

Biological institutions were located in Frunze: five institutes with 285 associates, among whom there were two academicians and four corresponding members. The attention of the biologists was concentrated on crop growing and animal husbandry. Institutions of the academy located in Tashkent played an essential role in the development of the productive forces of Uzbekistan.

The wartime conditions changed the management, structure and forms of work of the Academy of Sciences. Commissions turned out to be most convenient. They joined scientists together, regardless of the institution in which they were working, and made it possible to enlist specialists from other departments. The commissions engaged in comprehensive study of problems in close connection with the pressing needs.

Under the Division for Geological and Geographical Sciences of the Academy of Sciences there was a Commission for Strategic Raw Material. It included the academicians A. Ye. Fersman (chairman), I. P. Bardin, E. Z. Britske, N. T. Gudtsov, corresponding members S. I. Vol'fkovich and G. G. Urazov, and representatives of the people's commissariats of nonferrous metallurgy and ferrous metallurgy, the All-Union Scientific Research Institute of Aviation Materials and the All-Union Institute of Mineral Raw Material. In this same division, also headed by Academician A. Ye. Fersman, was the Commission for Geological and Geographical Service for the Army (150 scientific associates who were included in two expeditions and eight groups).

The Commission on Scientific-Technical Naval Problems was headed by A. F. Ioffe and his scientific secretary was I. V. Kurchatov. The commission joined together workers in science and the navy. It included A. P. Aleksandrov (current president of the USSR Academy of Sciences), academicians A. N. Krilov and V. M. Pozdnyunin, Professor G. A. Kalashnikov and others.

The Military Sanitation Commission under the Presidium of the USSR Academy of Sciences (chairman--Academician L. A. Orbely; members--academicians A. I. Abrikosov, N. N. Burdenko, K. I. Skryabin, A. D. Speranskiy and other



scientists) was associated with the Main Sanitation Administration of the Red Army, the Medical Sanitation Administration of the Navy and the USSR People's Commissariat of Public Health. Academician L. A. Orbeli was also in charge of the Commission for Discovering Additional Food Resources.

On 29 July 1941 in Sverdlovsk the Commission for Mobilizing Resources of the Urals for Defense Needs was organized. Its chairman was the president, Academician V. L. Komarov, and the deputy chairmen were academicians I. B. Bardin, E. V. Britske, A. A. Baykov, S. G. Strumilin and V. A. Obruchev, and the members were academicians N. T. Gudtsov, A. N. Zavaritskiy, G. M. Krzhizhanovskiy, V. S. Kulebakin, N. N. Semenov, A. Ye. Fersman and others. Participating in its work were representatives of people's commissariats of nonferrous metallurgy, the coal industry and the construction materials industry, the Committee for Matters of Geology under the SNK of the USSR Sovnarkom of the Kazakh Branch of the USSR Academy of Sciences, associates of Giprometz, the Ural Industrial Institute, Uralenergo, the administrations of the Turkestan-Siberian and Tomsk railroads, the Ural Military District, and the Sverdlovsk Obkom of the VKP(b). Leaders of party and soviet agencies actively helped the scientists. On 8 October 1941 the Sverdlovsk party obkom made it incumbent on "all party, soviet, economic, trade union and Komsomol organizations to render Academician Komarov's commission the most active assistance and support."<sup>3</sup> The commission developed a plan for mobilizing equipment and raw material and human resources of the Urals for the needs of defense.

In April 1942 the commission extended its activity to Western Siberia and Kazakhstan. The party and government highly rated this new initiative on the part of the scientists. On 12 April 1942 Academician V. L. Komarov received from the chairman of the GKO, I. V. Stalin, a telegram: "The government is happy to accept your suggestions concerning all-around development of the activity of scientific institutions of the Academy of Sciences and its active members and corresponding members which is directed toward strengthening the military might of the Soviet Union."<sup>4</sup> Further, on behalf of the government he expressed his confidence that the Academy of Sciences would honorably carry out its patriotic duty to the homeland. The work developed in 1942 for mobilizing the resources of the Ural area, Western Siberia and Kazakhstan was expanded in subsequent years. Several large comprehensive expeditions conducted research work on an immense territory of these regions. As a result they comprehensively studied the ore and coal base for ferrous metallurgy, the energy balance and so forth. The commission played an eminent role in expanding industrial production and increasing the extraction of minerals in the eastern part of the country. More than 600 people participated in its work, including representatives of scientific research institutes, VUZes, geological parties and industrial enterprises.

In Kazan in June 1942, on the basis of the groups of the Council for Studying the Country's Productive Forces a similar commission was created for the central Volga area and the Kama area. It was headed by Vice President of the USSR Academy of Sciences, Academician Ye. A. Chudakov. The commission worked mainly in the Tatar, Mary and Chuvash ASSR's, but it also included regions of Bashkiriya and Kuybyshev Oblast. Especially great significance was attached to the mobilization of petroleum resources of the "Second Baku" for defense

needs. As a result of the work of the special petroleum expedition the country received new regions which were rich in petroleum. The scientists discovered in the Volga area deposits of construction materials, chemical raw material and energy resources and established their industrial significance in the economy of this region and of the entire country.

During the war significant discoveries were made in aerodynamics, automation and mechanics, which determined the high level of development of aviation science. A theoretical solution to the main laws of the changes in the aerodynamic characteristics of the aircraft wing when changing over to high-speed flights was found by Academician S. A. Kristianovich. Academician N. Ye. Kochin provided a practical solution to the problem of the end of the wing. The work of the corresponding member of the USSR Academy of Sciences N. G. Chitayev and the group of scientists headed by M. V. Keldysh, Academician N. G. Bruyevich and others created the scientific base on which they designed the destroyers of A. S. Yakovlev and S. A. Lavochkin, the low-flying attack aircraft of S. V. Ilyushin, and the bombers of A. N. Tupolev, N. N. Polikarpov and V. M. Petlyakov.

The method of high-speed welding under flux which was developed under the leadership of the active member of the Academy of Sciences of the Ukraine, Ye. O. Paton, became a large scientific achievement. The high-speed welding equipment created at the end of 1941 increased the productivity of welding work on the armored bodies of tanks tenfold and produced more durable seams than with hand welding (which at that time required highly skilled welders). The bodies of the tanks welded with the automatic equipment withstood the fire of antitank cartridges while the ones that were welded by hand were destroyed. The automatic welding by the Ye. O. Paton method radically changed the technology for manufacturing tanks. In 1941 for the first time in world practice their production was placed on the flow line. By the end of the war there were no seams welded by hand on the bodies of the tanks.

In Germany there was no automated welding of armored equipment until the end of the war, and in the United States it appeared in 1946.

It was an especially difficult task to discover the reduced-metal mines which in terms of their physical properties were not very different from the soil in which they were hidden. Sometimes the enemy used mixed mine planting with metal and nonmetal mines, which made it possible to completely clear the fields with the existing means.

The Main Military Engineering Administration of the Red Army turned to the USSR Academy of Sciences with a request to create an instrument which made it possible to fight effectively against enemy mines. Such an instrument was created. They used ultrashort electromagnetic waves in it. One of the creators, a specialist in the area of seismographic and electrical prospecting, A. G. Ivanov, was enlisted to develop the technical design of the mindfinder for mass manufacture. He went to the engineering-sapper brigades of the First Baltic Front where they were conducting testing and taught the military man to work with the mine finders under military conditions. As compared to foreign models, this instrument was very sensitive. In the

document for the testing it was pointed that it makes it possible to reliably discover all kinds of nonmetal mines.

Associates of the Energy Institute of the USSR Academy of Sciences, under the leadership of the corresponding member of the USSR Academy of Sciences, I. S. Bruk, designed an instrument for controlling fire which was connected to the arms on the aircraft with synchronic communications. On the basis of this they constructed the first domestic remote electrical aircraft firing installations. They considerably facilitated air combat.

Scientists of the USSR Academy of Sciences invested their knowledge and labor in improving reactive artillery and creating radar installations, optical devices, means of fighting against mines in the water, and so forth.

In 1942 alone the Military Sanitation Commission of the Academy of Sciences, which engaged in surgery, therapy, epidemiology and sanitary hygiene, developed and introduced 30 concrete proposals which contributed to improving the sanitation service for the army. Academicians N. N. Burdenko, A. A. Bogomolts, A. V. Palladin, N. D. Strazhesko, N. N. Anichkov and other associates found effective means of fighting against complications from wounds, infections and sepsis and they created new preparations for treating the wounded.

The scientific and technical assistance from industry was reflected in the research that was conducted under assignments of the plants, in consultations, expert evaluations and conclusions drawn from the work of enterprises. Scientists of the academy did not remain aloof from the wartime food problem either. The work of academicians D. N. Pryanishnikov, L. I. Prasolov, corresponding members A. N. Maksimov, B. L. Isachenko and A. P. Vinogradov, Professor N. A. Krasil'nikov and many others contributed to increasing the productivity of agricultural crops in Central Asia, saved the planet areas from pests and weeds, and helped to avoid losses when gathering the harvest.

And after the academic institutions had returned to their permanent scientific bases they continued to render scientific and technical assistance to the army and industry and agriculture. Nor did the academy slacken its activity for developing the productive forces of various regions. But the scientific forces were regrouped. The commissions for mobilizing the resources of the Urals, Western Siberia, Kazakhstan and the Volga area were abolished and their functions were transferred to local scientific institutions of the Academy of Sciences--branches and bases. The forces of the Central Institutes of the Academy were directed toward expanding scientific research work and assisting in the restoration of the national economy in the regions that had been liberated from enemy occupation, primarily the Donets coal basin and the metallurgical industry of the South.

The first session of the USSR Academy of Sciences during the war years took place in Moscow during 25-30 September 1943. Its decisions oriented the Academy of Sciences toward large-scale theoretical research. In the very height of the war they renewed work on fission of uranium nuclei, which was headed by Academician I. V. Kurchatov. The research on cosmic rays (A. I. Alikhanov), the new principle of acceleration of particles--autophasing (V. I.

Veksler), the phenomenon of superconductivity (P. L. Kapitsa) and many other discoveries of these years have been included in the rich achievements of domestic science. The fact that the USSR Academy of Sciences helped simultaneously to carry out national economic tasks, to render assistance to the front and to conduct theoretical fundamental research bore witness to its power and maturity.

During the war years in the activity of the USSR Academy of Sciences there was a clear manifestation of the features that are inherent in socialist science: a high level of research, planning and comprehensiveness in solving scientific problems and a link between theory and practice. The Academy of Sciences was in step with the entire country and all of its work was devoted to the interests of the country.

#### FOOTNOTES

1. VESTNIK AKADEMII NAUK SSSR, No 11, 1947, p 51.
2. Archives of the USSR Academy of Sciences, f. (fund) 2, op. (inventory) 4-1942, d. (file) 33.
3. "Istoriya Velikoy Otechestvennoy voyny Sovetskogo Soyuza 1941-1945" [A History of the Great Patriotic War of the Soviet Union of 1941-1945], Volume 2, Moscow, 1961, p 536.
4. Anniversary session of the USSR Academy of Sciences, Volume 1, Moscow, 1948, p 59.

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## ERROR OF BOURGEOIS HISTORIANS REVEALED

Novosibirsk EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA (EKO) in Russian No 5, May 85 pp 45-58

[Article by A. N. Mertsalov, doctor of historical sciences, professor, Institute of History of the USSR Academy of Sciences (Moscow): "Through the Eyes of Bourgeois Historians"]

[Text] The economic factor exerted an immense influence on the outcome of World War II. The victories of the Soviet army would have been impossible without a consolidated, self-sacrificing rear. But in trying to play down the USSR contribution to the defeat of fascism, bourgeois historians try to belittle the significance of the USSR economic victory as well.

### Evaluation of the Soviet Prewar Potential

Conservative historiography distorts the history of socialist construction in the USSR during prewar years. Nonetheless, certain of its presentatives state that the powerful economic potential created in the USSR during the first five-year plans was decisive in the victory over fascist Germany. But the USSR prewar military and economic potential is frequently rated by bourgeois authors not at all from the standpoint of its application against fascism. Anticommunists accuse the USSR of "militarism," a desire for aggressive wars. Only a few of them associated the USSR attention to its defense with the threats from imperialist states.

The essence of the problem, to which the majority of conservative critics are indifferent, consists in whether or not the military and economic preparation of the USSR was sufficient for the beginning of the fascist aggression. As we know, it had not been completed. The changeover of industry to the production of new types of arms was not completely carried out until the war was in progress. This is discussed in detail in the memoirs, for example, of the people's commissar of the aviation industry, A. I. Shakhurin. From January 1939 through 22 June 1941 the air force received from industry about 18,000 combat aircraft, of which only about 3,000 were machines of new types.

There was a similar situation with respect to rifles. Although the Red Army has the best models of pistols and machine guns, during the first months of

the war the Wehrmacht had 16 times as many of these weapons. We did not manage to complete the reequipment of the artillery either.

FRG historians devote a great deal of attention to the underestimation by the fascist leaders of the Soviet economic potential on the eve of the war. A moderate conservative, A. Hillgruber, notes that "the traditional opinion about Russia helped to make the decision to carry out Hitler's idea of a racial-ideological war to the point of destruction." From June 1940 until June 1941 the idea of the "clay Colossus" prevailed in the military and political leadership of Germany. The fascists had a "quite inadequate" idea of the "Russian railroad with its inept management"; they considered Soviet arms to be "old," "especially tanks"; they did not take seriously the Eastern industrial areas of the USSR. Upon returning from a trip to the USSR the chief of the Division for the War Economy and Arms of the United Wehrmacht Command (OKV), General G. Tomas notified Hitler that it would be impossible to do battle with the Soviet Union. The latter rejected this idea: "We are allowing ourselves to be deceived with Potemkin villages. Bolshevism can only destroy and will never be able to create anything."

It is known that in the fascist elite there prevailed the opinion that since Moscow forms the economic, political and spiritual center of the USSR, to take it would cut off the country's ties and it would capitulate. E. Veizecker, an eminent fascist diplomat, held another opinion. He wrote that the USSR, relying on its Asian errors, "will be able to continue the war for an unpredictably long period of time." A moderate conservative scholar, A. Bagel-Bolan, thinks that the "complete underestimation of the Soviet Union as Hitler's cardinal mistake" is difficult to explain since the authors of a number of publications had pointed the military and industrial might of Russia even during the prewar years. Hillgruber includes among the reasons for the uncritical attitude toward the estimation of the USSR in fascist Germany the long-standing Russophobia and anticommunism. A moderate conservative author of works on the German fascist armed forces, H. Boog, also refers to the cult of Hitler, saying that everyone in Germany who, in spite of the Fuehrer's opinion, "spoke the truth about the Soviet armed forces was regarded as a victim of Soviet scheming."

The underestimation of the Soviet defense capabilities was related to the idea of a blitzkrieg which was being promoted by the fascist leadership. One of the reasons for adhering to this idea was the fact that Germany was not capable of a prolonged war. It depended on foreign sources for 25 percent of its zinc, 50 percent of its lead, 70 percent of its copper, 90 percent of its tin, 95 percent of its nickel, 99 percent of its bauxites, 65 percent of its petroleum and 80 percent of its rubber. Fascist leaders could not but be aware of this. It is interesting to think about the research of many bourgeois historians on the question of the two formulas for armament: "in breadth" and "in depth." The former presupposed sharply increasing the number of military units and supplying them with arms and military equipment; the latter envisioned an essential expansion of the base of the military industry, the creation of supplies of raw material, increased production and the accumulation of objects for rear support. In December 1939 Tomas suggested "arming in depth" but Hitler rejected this proposal. Researchers say that Tomas's plan would have required "sensitive limitation of production of

nonmilitary products for the population." One must not fail to take this into account when thinking about the fear the ruling circles had of their own people. For this reason, as certain bourgeois historians think, a prolonged war was unacceptable for Germany.

"In the contest between the formulas of armament 'in breadth' and 'in depth,'" writes the moderate conservative English historian A. S. Millwood, "the former won out as being the more suitable." This idea "made its way directly to the hearts of Hitler and his regime." Millwood also points out that the connection between "armament in breadth" and the doctrine of a short-lived war appeared during the course of the war itself. "As long as the German economy was operating under the conditions of the blitzkrieg strategy, its armed forces achieved extraordinary successes. With the failure of this strategy in January 1942 and the subsequent change in economic strategy there also began a lengthy phase of military defeats."

In the opinion of the eminent moderate conservative historian G. A. Jacobsen, Germany had lost the war even before the first shot was fired.

Even the first weeks of military action dispelled many of the illusions of the fascist elite. The opinion that the Soviet army had an "extremely strong artillery" began to dominate in the Wehrmacht command. They also had a high opinion of Soviet tanks. For several years Germany tried in vain to create a tank which would "surpass in its qualities the Russian T-34," recalled the former minister of the German war economy, A. Speer. P. Fabri quotes Hitler's words (July 1942): "It is clearly stupid to ridicule the Stakhanovite system. The arms of the Red Army are the best confirmation of the fact that this system...has turned out to be unprecedentedly successful."

In the latest literature many extremely conservative judgments of the Soviet economy on the eve of the war have been considerably revised, which is shown, for example, by the book of E. Kreidler, "Railroads in the Areas Controlled by the State 'Axis' During World War II," which has a consistently calm tone. This is perhaps the only West German work where one of the most important branches of the Soviet economy is compared directly with the corresponding branch in Germany.

#### Judgments About the Soviet Military Economy in 1941-1945

The latest literature contains judgments about the restructuring of the Soviet national economy for wartime conditions, the relocation of the USSR productive forces away from the zone of the front, the arming of the Red Army and other important aspects of the USSR economy during the war years.

The changeover of the economy to an industrial basis has been discussed relatively objectively in only a few works, for example, by the bourgeois democratic historian R. Lawrence. An overall evaluation of the restructuring is presented in the book by K. R. Ruffmann. In his opinion, "it was possible to reorient the Soviet economy for military purposes in a short period of time and without difficulty...."

The changeover of the USSR economy actually was accomplished in a short period of time, but one cannot say that this took place "without difficulties." In a brief history of World War II written by an international collective of authors it is stated quite correctly that "it was necessary to create the USSR military economy in an incredibly difficult situation." K. G. Ruffmann himself came to this conclusion later.

The relocation of Soviet productive forces to the east was given a relatively objective evaluation in the works of individual representatives of bourgeois historiography of past decades. Thus the English liberal historian V. Wert included this operation "among the most impressive organizational feats of the Soviet Union during wartime." In the latest literature such judgments are encountered more frequently. A number of works note the overall significance of the relocation of the military industry. Lawrence equates it with "the most important victories of World War II." In the three-volume West German publication "World War II" we read: "This gigantic assignment, which consisted in disassembling entire factories and changing them over for the output of military products and restoring them in the Urals and in Western and Eastern Siberia--was carried out under amazing circumstances. The relocation of people which was made necessary by this disassembly of industry took place in a disciplined way and successfully. In spite of the sufferings caused by the resettlement of population into an area with a cold climate, the citizens did this without complaint when frequently they did not even have elementary supplies." One of Wert's compatriots, J. Ericson, says that the numerous plants began to produce prepared arms within a couple of weeks after the last carload of equipment had been unloaded.

Millwood considers the geographical factor to be one of the reasons for the USSR's success: "Enough space is undoubtedly one of the necessary conditions for a war." He goes on to say that during their retreat from the Eastern Front the Germans also tried to carry out a similar evacuation. But they apparently encountered a "major difficulty": they were unable to find a place where it would be possible to put the relocated enterprises into operation again. But what kept them from locating the industrial facilities just as close together as they are, for example, in the Ruhr basin?

Certain historians speak with complete justification about the expediency of relocating the USSR productive forces by the time of the aggression as a condition for successful functioning of the Soviet military economy. In Millwood's book we read: "If the eastern areas had had no industry before the war and had not had the necessary resources, this extraordinary relocation of the productive capacities would never have been successful." It is stated that the evacuation frustrated the plans for taking over and utilizing the productive capacities of the USSR. "This relocation of the defense industry," writes the moderate conservative K. Reinhard, "was quite unexpected for the Germans and to a decisive degree influenced the fact that the German military industry was unable to carry out its tasks--for a considerable proportion of the products had to be produced according to new plans in the regions that had been occupied." A. Speer and other historians make a connection between the successful evacuation of the productive forces and the "catastrophe of supply" which the Wehrmacht suffered on the Eastern Front



during the autumn and winter of 1941-1942. Their plans to take over the USSR resources had failed.

A very specific aspect of the problem was touched upon by the extreme conservative V. Bertholdt. Not without some disappointment he notes that "the Soviet military industry quite unimpeded--that is it was not threatened by German air attacks--could break its own records and supply the Red Army with arms that were superior to arms of the Wehrmacht." Boog thinks that the German armed forces were not prepared for war against industrial centers.

During the time of the war, as we know, the USSR produced arms and military equipment in twice the quantity and of better quality than that of fascist Germany. In spite of the overall tendentiousness of their work, many bourgeois historians note the outstanding successes of the USSR in arms production. Thus D. and G. Lyon state that "the USSR was able to produce a first-class arms system." "The most surprising thing of all," emphasizes A. Siton, "is not the size of the army, but the immense supplies of arms, tanks, machine guns, ammunition and uniforms...."

The latest literature from the FRG devotes a considerable amount of space to a description of individual kinds of Soviet military equipment, especially tanks. General and Doctor of Sciences F. M. Zenger und Etterlin has devoted special research to this. His book, which was published at the request of the extremely conservative Society of Military Research, is not without anti-Soviet tendentiousness. But the author is objective when he discusses military technical issues. "The Soviet T-34 tank was," he writes, "undoubtedly a masterpiece in the history of the development of military equipment. This tank had heavier arms than the corresponding types of tanks in the West; it had a better engine, which operated not on gasoline, but on diesel fuel; it had more reliable armor; and it had greater ability to cross various kinds of terrain. Its pressure on the ground did not exceed 0.75 kilograms per square centimeter, while the corresponding figures in Western models were from 0.95 to 1.0 kilograms per square centimeter." The same opinion is held by participants in the eastern campaign of the Wehrmacht. G. Guderian reported on the "excellent Russian T-34 tank." The authors of the book "Fateful Decisions" noted that in the face of Soviet tanks the German infantry "turned out to be quite defenseless." The idea of the superiority of the T-34 over German tanks is shared by the authors of many new book with which we are familiar. Some of them bear witness to the fact that the Soviet military machines were the best tanks in World War II. Such is the estimate of Bertholdt and P. Gostona.

Many West German historians and memoir writers note the unsurpassed qualities of Soviet artillery. According to Hitler's instructions, the experience in created Soviet artillery systems was to have been used for improving German weapons. In November 1942 Hitler demanded that they prepare approximately 180 howitzers which had been taken during the first months of the war so that they could be used by the German troops. Many authors especially emphasize the "high effectiveness" of Soviet jet-propelled equipment. "The famous 'Katyushas'," states the extreme conservative G. M. Schweinberger, "were surprisingly simple, but highly effective.... Near Moscow they put German troops in a state of shock. Anyone who cam under the rocket cover could hear

organ music in the sky." The author is punning with the widespread name for Soviet rockets in the Wehrmacht: "Stalin's organ."

Many historians note the superior qualities of Soviet aviation, especially the famous IL-2 low-flying attack planes, and they discuss the "Russian ground armament which was more effective and modern than that of the Germans," and the "excellent Soviet automatic rifles," which many German soldiers preferred to their own. Indeed, the German generals after their defeat near Moscow were forced to raise the question of immediate rearmament of the ground troops because of the superiority of Soviet rifles. And the Red Army did not have to rearm its rifle units during the course of the war. The PPSH-41 pistol machine guns had a longer distance of effective fire (direct shot). Moreover, the corresponding MP-40 weapon was greatly inferior in terms of the speed of fire (350 rounds per minute as opposed to 950).

Other important issues related to the Soviet military economy have also been elucidated. One of them is the problem of the labor force in the USSR during the war years. A number of bourgeois historians interpret this in the spirit of the thesis which is traditional for conservative historiography concerning the "Russian numerical superiority": the USSR "did not experience a shortage of labor force." In fact this plan was extremely critical in the USSR.

The quite obvious facts are these. The number of workers and employees dropped to 18.4 million in 1942, including to 7.2 million in industry, which amounted to 59 and 65.5 percent of the 1940 level, respectively. The shortage of labor force was especially critical at the end of 1941 and the beginning of 1942, during the most difficult period for the Soviet economy. But this most difficult problem was solved thanks to the advantages of the socialist system and the patriotic enthusiasm of the Soviet people, efficient planning, the introduction of advanced technology and continuous improvement of the organization of production.

Many conservative historians write that "it is difficult for the Western mind to imagine working from 10 to 12 hours every day," that labor legislation in the country was compulsory in nature. Here they take up the old idea of Red Army soldiers who "had become accustomed to living and fighting with the lowest standards." These ideas inadvertently or deliberately sidestep the real reasons for those difficulties and deprivations that were experienced by the Soviet people: the defeats of the Red Army during the first years of the war and the actual single combat of the USSR against the forces of Germany and its allies during 1941-1944. A comparison of working conditions in the USSR, Germany, the United States and England is groundless. The war did not come to German territory until 1944-1945. The United States and England were not invaded at all. This is also noted by certain bourgeois historians. The damage the war caused to the Soviet Union amounted to more than 40 percent of the losses of all participants (the United States--only 0.4 percent). The USSR lost 30 percent of its national wealth in the war.

Certain bourgeois historians also mention the self-sacrificing labor of the workers. One of the adherents of the doctrine "economy on order," E. Mashke, notes the "voluntary readiness for sacrifice in order to increase the results of labor and the "great increase in labor productivity of the workers and

kolkhoz workers, which was achieved with clearly inadequate supply." "The colossal scope of the mass labor victory," wrote Wert, "has never been equaled."

The latest bourgeois literature, like that of the past, has a fairly broad representation of ideas about the strategic deliveries from the Western allies of the USSR. They are directly related to the evaluation of the Soviet military economy and also to a more general problem: the question of the role of the USSR, the United States and England in the victory over fascism. The attention of the historians is drawn mainly to the significance and the motive of Allied assistance.

The majority of bourgeois historians regard the deliveries under the lend-lease plan as the main thing or at least an extremely important condition for the victory of the USSR in the war. Describing the deliveries to the Soviet Union they speak of them as nothing less than "gigantic," "extreme," "an immense flow of arms, machines, ships, engines and petroleum." According to the assertion of a number of American authors, Soviet industry was close to a catastrophe and only with abundant deliveries under the lend-lease program did it manage to fully equip a first-class army.

Did the lend-lease deliveries really "save" the USSR from economic collapse? The critical moment in the development of the Soviet military economy in 1941-1942 was overcome with a very insignificant amount of assistance from outside, and as for the safety margin, without which any system will suffer a catastrophe, this margin existed at that moment and, more important, subsequently as well. Certain bourgeois historians are expressing the idea that even after having lost Moscow, the USSR would have still been able to continue the resistance. It would have lost this capability only after losing the Ural and Siberian regions. It has also been pointed out in Soviet literature that in 1943-1945 the USSR economy not only supplied the front with everything it needed, but also has certain reserves.

"The deliveries from Western powers," wrote A. N. Kosygin, "had a certain amount of significance, of course, but far from the amount indicated by bourgeois propaganda. "The volume of deliveries in relation to domestic production in the USSR did not exceed 12 percent for aircraft, for tanks--10 percent, and for artillery--2 percent.

When speaking about the motives for allied assistance to the Soviet state one should agree on the initial position. Assistance on any scale in the form of deliveries cannot replace immediate active participation of the armed forces of the Allies equal to that of the Red Army in the war against the common opponent. This participation, as we know, was very late in coming, so that it might as well not have come at all. This is how one should approach the question of who should be grateful to whom. Deliveries of materials, regardless of their volume, quality, regularity and promptness, is a pathetic palliative. We share the opinion of Gostona concerning the "material assistance from the West to Russia as 'substitute' for a second front" (here he stipulates that he is using this word "not without some humor"). One automatically recalls how during the war the Red Army men, having waited in vain for active military actions on the part of the allies, began to call the



"second front"...the American canned meat, the deliveries of which bourgeois historians are now extolling.

The lend-lease was used by the monopolies to expand production in their country, to obtain excessive profit and to achieve economic penetration into the countries of Europe and Asia. But it would also be a mistake to reduce everything to this. According to the estimate of the American moderate conservative J. L. Haddis, the opposition within the United States was overcome as soon as Roosevelt proved that the defense of the Soviet Union is "vitally important for the security of the United States." In the opinion of the author, the attack on the USSR "removed the immediate threat of an invasion" into England and the United States, and a "quick and complete victory for Germany (over the USSR--A. M.) would be tantamount to the greatest catastrophe for England and America." The moderate conservative R. B. Levering shows that deliveries to the Soviet Union corresponded to American interests since "the defense of the USSR was vitally important for the security of the United States."

In a number of works by bourgeois historians an attempt has been made to give an evaluation to the USSR military economy as a whole. The French liberal scholar A. Michelle noted the general economic preparedness of the USSR for a lengthy war and emphasized the significance of the heavy industry that had been created in the country during the 1930's. The Soviet economy, despite the loss of many developed industrial regions, "produced more arms than did the German economy,"--Magnitogorsk conquered the Ruhr." The economic victory of the USSR, in the opinion of the author, was provided by the general skillful leadership, the activity of scientists and the immense efforts on the part of the people.

It is known that during 1941-1944 production in the USSR and Germany (taking into account imports from the occupied and other countries) had the following ratios: electric energy--1:1.8, coal--1:4.8, and steel--1:2.6. But for each ton of smelted steel the USSR produced 5 times more tanks and artillery equipment than Germany did, and for each metal-cutting machine tool--8 times more aircraft. In the middle of 1942 the growth of military production took place because of the increased productivity of labor against the background of a reduction of material expenditures. Thus the number of man-hours expended for the production of IL-4 and PYe-2 aircraft, T-34 and KV tanks and 76-millimeter machine guns decreased in 1941-1943 to two-thirds the previous level.

The degree of effectiveness of the utilization of resources in the states participating in the war depends on their goals and their socioeconomic and political organization. In bourgeois historiography one can find only individual remarks pertaining to this important problem. The French moderate conservative historian R. Aron, in particular, assumes that the USSR had a greater coefficient of mobilization than the countries of Western Europe and the United States did. The English publication RUSSIAN FRONT notes the effectiveness of the rapidly organized military production of the USSR, its orientation toward mass output of a limited number of models of arms with strict standardization, and the skillful utilization of resources.



But the majority of bourgeois historians, while noting the exceptional achievements of the Soviet economy, either ignore their main source--socialism--or directly deny it. They bring to the fore either the thesis about the "economy-on-order" or the old Russophobia thesis about the "mystery of Russia." The false idea that the outcome of the war was determined by a combination of "Russian human resources and Western technology" has become widespread as have assertions about the general cultural backwardness and the military and technical dependency of the USSR which are related to this and are counting on the complete ignorance of the readers. Trying to denigrate the exceptional achievements of Soviet tank builders which he himself emphasized, Zenger und Etterlin notes that they took advantage of the experience of U.S. and English designers. The extreme conservative V. Dirich writes about the "strong similarity between Soviet bombers and the American Douglas-S-47." Organically related to these ideas is the thesis concerning Soviet intelligence as the main factor in the victory of the USSR. All this is in harmony with imperialist propaganda.

The development of science and technology is a unified world historical process. It never has been and cannot be a monopoly of any single nation or any single state. "In the Great Patriotic War," noted the eminent designer, M. T. Kalashnikov, "the Soviet rifles were unsurpassed. The design embodied the best age-old traditions of Russian weapon masters and the achievements of world practice in this area." The original scientific and technical developments of prewar years made it possible to create first-class tanks, aircraft, artillery and other arms. In 1941-1945 many scientific and technical decisions were realized by Soviet specialists for the first time in the world. Among them were thermal processing of parts by high-frequency currents, automated welding of the armored bodies of tanks, and stamping of tank turrets.

Equally unsubstantiated is the assertion of a number of bourgeois historians that the USSR produced arms that were simple in structure and use based on the "low level of education of the majority of soldiers in the Red Army." The Soviet military equipment was indeed distinguished by its simplicity and exceptional reliability in any combat situation, according to the words of B. H. Liddel Hart, its "high durability and reliability." But this is precisely now military equipment should be in general since it is intended for use under extreme circumstances. Soldiers in the Red Army were certainly not illiterate. In 1941, for example, there were more students in the USSR than there were in England, Germany, Italy, France and Japan taken together.

The Soviet arms were simple not only for combat use, but also to produce. This should undoubtedly be included among the greatest military and economic achievements of the USSR. When in December 1940 it accepted the machine gun of G. S. Shpagin for use as a weapon, the state commission noted that even with its superior qualities the production of the machine gun would not require alloyed steels, complicated equipment or large expenditures of machine tool time. The machine gun of A. I. Sudayev had even better technical and tactical characteristics and, according to the estimate of a number of foreign specialists, it was the best machine gun in World War II. Its manufacture took half as much metal as the ordinary machine gun did and it took one-third the amount of time to process and assemble the parts.

Although in the latest literature the FRG has been paying somewhat more attention to the Soviet economy in 1941-1945 and its immediate prehistory, on the whole bourgeois historiography has not been able to interpret the colossal creative forces that lie in the socialist economy. It has not shown that the USSR economy turned out to be more capable of rapidly reacting to the growing demands of the modern war; that in a planned and highly concentrated economy human and material resources are utilized more fully and more effectively; that the Soviet Union like no other country was able to successfully combine heavy military and economic opposition with the restoration of the national economy in the liberated regions and assistance to antifascist forces in other countries; and that the USSR, even during wartime, retained its economic independence. Conservative literature either underestimates the contribution of the Soviet military economy to the victory of the antifascist coalition or it is silent on the subject.

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## POSSIBILITIES OF ECONOMIC RESTRUCTURING SURVEYED

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[Article by B. P. Kurashvili, candidate of jurisprudence, chief of the sector on the theory of state management of the Institute of State and Law of the USSR Academy of Sciences (Moscow): "The Contours of Possible Restructuring"--a discussion]

[Text] The 26th CPSU Congress and the plenums of the Central Committee that followed it devoted a great deal of attention to problems of management of the national economy. At the February (1984) Plenum of the Party Central Committee it was especially emphasized that the system of management of the economy and our entire economic mechanism is in need of serious restructuring, that it is necessary to update economic structures and the next 5 years should be a five-year plan of a decisive changeover in the matter of intensification of all branches of the national economy. In the article "On the Level of Requirements of Developed Socialism. Certain Crucial Problems of Theory, Strategy and Tactics of the CPSU," it was pointed out: "Our economy itself has come right up to the point where the qualitative progress and changes in it have become, as it were, an imperative need" and that now it is necessary to discuss "large ideas and goals" which have not simply economic, but above all "political economic" substantiation.

The history of the USSR knows reforms which have led to achievements which have radically changed the country's appearance and its appearance in the world. At the same time, as in any living history, there have been unsuccessful restructurings which, as they say, looked good on paper but did not take into account the pitfalls of real life and therefore did not produce the expected results. But one learns from experience.

As in many complicated problems, when developing the program for comprehensive restructuring it is necessary, according to Lenin, to single out the basic link in the chain of tasks which, when one grasps it, one can pull the entire chain. At the 26th CPSU Congress and subsequent plenums of the Central Committee this basic link has been named--expansion of the independence of enterprises and associations and the rights and responsibilities of labor collectives. Expansion of the independence of enterprises (we shall use this

abbreviated expression)--such is the logical nucleus of this program and all of it, it would seem, amounts to answering four interconnected questions.

**First Question: What Is the Social Point of Expanding the Independence of Enterprises?**

For an answer to this let us turn to an analysis of the production relations and economic policy of socialism. The concrete production and economic ties are based on public, mainly national ownership of the means of production, on state authority to dispose of them. At the same time public production funds are transferred to enterprises for production and economic use. This is a material prerequisite with respect to the isolation of the main link of the production apparatus of the economic system.

In their social essence production relations, as a result of the socialist revolution, are being transformed from relations involving the exploitation of man by man and capitalist competition into relations of fraternal cooperation. In an overall atmosphere of fraternal cooperation labor competition takes place, a natural consequence of the socialist principle of distribution according to labor. This principle precludes leveling in distribution: when certain people receive more goods from their labor than others do.

When entering into production and economic ties the workers strive to satisfy their own immediate interests for food, clothing, education of children, social prestige and so forth). And the overall result of their actions are the material prerequisite for satisfying the interests of the society as a whole (expanded reproduction, the development of the social structure, education of the younger generation, environmental protection, defense and so forth). Through concern for current needs one satisfies general and long-range needs.

The appearance, change and transformation of concrete production and economic ties can take place along two paths: both at the personal discretion of the producers, through their conclusion of various kinds of agreements and through the direct will of the state. In the former case the actions of the producers are not directed by anybody's will, but by production relations themselves. These relations act as a direct regulator of economic life. The mechanism of economic self-regulation is functioning.

The direct regulating role of production relations is strengthened by the state, which combines the actions of the producers and guarantees distribution according to labor. At the same time state management involves a greater or lesser limitation of the mechanism of self-regulation--for the sake of the interests of the whole. The dialectically contradictory concrete historical combination of the mechanism of economic self-regulation and state management of the national economy also forms the economic mechanism which is an overall integrated system for management of the country's unified national economic complex.

The production relations of socialism are distinguished depending on whether the society is developing under normal or extreme conditions. Civil war and foreign military intervention; industrialization and collectivization under



the conditions of the developing war; the Great Patriotic War when the words "All for the Front, All for Victory!" were the highest law of economic life; the years of postwar restoration under the conditions of the atomic blackmail of imperialism and the aggravation of the "cold war"--these are the causes for the extraordinary policy which history has imposed upon us. The changeover to management under the conditions of normal economic life has been in progress approximately since the end of the 1960's and it has not been without difficulties and interruptions.

Remarkable new things have grown out of the old during the past 2 decades. Such, in particular, is the brigade contract and the collective contract in general--it seems to me that it can be regarded to a certain degree as a model for the economic mechanism as a whole. Along with the experience of the NEP--a policy which, along with elements that have receded into the past for good, also contains eternal lessons--and the extremely valuable experience of other socialist countries, this comprises a rich arsenal of material for revealing the peculiarities of the production relations of socialism within the frameworks of various types of economic policies.

Under the extreme conditions it was necessary to rely on a clear predominance of common interest (with a minimum satisfaction of individual ones); on direct state management of production activity (with a severe limitation of the mechanization of self-regulation); and on state authority to dispose of resources (with severe limitation of the independence of enterprises in maneuvering them).

Under normal conditions the emphasis shifts to satisfying current interests (with flexible but mandatory priority of long-range, common interests); to granting the enterprise extensive freedom in maneuvering the resources allotted to it (with unconditional retention of state ownership of the means of production); to labor competition which influences differentiation of the level of consumption and mutual control by the participants in production (with unconditional retention of the overall atmosphere of fraternal cooperation); and to the inclusion of the self-regulation mechanism and thus the liberation and stimulation of creative initiative, energy and socialist enterprisingness (with unconditional retention of the supremacy of the state in managing economic affairs and strict state discipline).

State centralized regulation of economic life is concentrated mainly on solving strategic problems and is reinforced and strengthened within this framework. But the democratic bases are given space, being expressed primarily in the development of forms of socialist self-management (this concept was used in the law concerning labor collectives adopted in June 1983).

The restructuring of the system of management of the national economy on the basis of expanded independence of the enterprises not only leads to a jump in the effectiveness of production, but also serves as an impulse for realizing the course established in the USSR Constitution toward further development of socialist democracy. It activates the profound social factors in the development of production and social development as a whole. This is an immense reserve which does not dry up, but increases as it is utilized.

## Second Question: What Changes Should Be Made in the System of Planning?

Under conditions when the fate of the state and the social structure depended on operational satisfaction of the immediate social needs and it was necessary to use up all the existing resources, special-purpose national economic planning with subordinate significance of economic levers and stimuli became the predominant form in our country. It is more than a half-century old. At one time it was exceptionally effective and became the motive force for a real economic miracle. Then the situation began to change gradually. The complication of national economic ties, the acceleration of scientific and technical progress and the strengthening of social factors in development began to require extensive application of economic methods of management. Yet the established special-purpose value indicators (growth, sales volume, volume of normative net output, fund normatives) and physical indicators (rolled metal and even individual kinds of equipment according to weight, ton-kilometers and so forth), on the basis of which the system of remunerations is arranged, sometimes leads to work which clearly does not correspond to the needs of the society. Let us recall the poor-quality and unfashionable sewn products: although there are no consumers for them they are included in the fulfillment of the plan with all the ensuing favorable consequences for the manufacturers. The enterprises are essentially rewarded for the fact that they have made material unusable, have wasted energy and live labor, and have missed the opportunity to produce a useful product, that is, they have caused harm to the society. Moreover the special-purpose assignments, regardless of how much we would like it, cannot encompass all of the diversity and dynamics of public needs, provide for balanced development of the economy and envision and optimize the billions of concrete production and economic ties. There is one solution: special-purpose planning in the majority of the national economy should give way to the kind of planning which would generalize and flexibly direct toward public benefit the production and economic initiative which is subject to economic laws and the mechanism of economic self-regulation. In other words it is necessary to have state planning which would use economic levers to a considerably greater degree.

Initiative is an immense social value. It is significantly limited by detailed special-purpose planning and trivia, and these should be allowed only as a temporary measure. On the other hand, the complicated problem of the best ratio between the plan and initiative under normal conditions can be resolved only centrally. In particular, in our opinion, this should be the new strategic role of the center.

The policy whereby the enterprise is told not only what and how much to produce, but who are to be the suppliers and consumers--such a policy leaves little space under current conditions for economic maneuvering from below and few opportunities for manifesting production and economic initiative.

Of course the independence of the enterprises cannot be unlimited. It is limited by the rules of economic self-regulation (which are formulated in contractual practice) and are predetermined by the norms of the law and the legal instructions from state agencies. This kind of independence, while the

state retains a decisive role in the organization of the national economy as a unified whole, combines best with primarily "economic" planning.

What should its basic elements be?

The enterprises draw up their own plans (annual, five-year and long-range), they select their own contracting agents and they determine the content of their own agreements with them. The plans of the enterprises are drawn up on the basis of the portfolio of orders--thus the recognized needs of the society and its collective and individual members are given direct access to production and production is made subordinate to the consumer.

The selection of the suppliers and clients and the determination of the content of the relations with them are directed by the regulating force of the market. The socialist market is primarily a state-controlled system of agreements among enterprises which correspond to the needs of the society and make it possible to realize fraternal relations of cooperation and labor competition. Let us recall that V. P. Lenin repeatedly pointed out that the economic policy of the socialist state presupposes not a fear of the market, but a serious attitude towards its laws and practical mastery of them.

The state is certainly not limited to the control of the market and the actions of enterprises, but actively influences them with economic means. The generalized indicators of the state plan should stipulate the level of satisfaction of public needs and the resources (material and financial) which can be expediently utilized by state agencies as economic levers and stimuli for influencing the enterprises. Experience convincingly shows that such means are more effective than the usual allotment.

The interconnection between the planning processes that take place "from below," at the level of the enterprises, and "from above," at the level of the state, is provided by the corresponding planning procedures. The state takes into account and generalizes the preliminary plans of the enterprises which they have drawn up on the basis of the portfolio of orders, it determines which tendencies in the reproduction process should be supported and which should be impeded, it develops the strategy for the planning period and informs the enterprises of its intentions to stimulate the production of individual kinds of products with its own resources (funded materials, tax rebates, credits and so forth) and "destimulate" outdated production (in additional taxes, increased control conditions and so forth).

After this, in the second and final stage of planning the system of agreements is formed for the planning period. Along with purely economic (among enterprises) agreements, they conclude administrative and management agreements among agencies of the state and the enterprises (on orders from the state and under the conditions of the utilization of the resources granted to them). On the basis of these and other agreements the enterprises draw up and accept their own plans, and the state agencies register them.

When generalizing the plans of the enterprises and envisioning the desirable directions for adjusting them (not that which exists now!) throughout the course of the planning period, each state agency at its own hierarchical level



draws up drafts of its own plans. They are also generalized at the statewide level. General state plans are developed and accepted under the policy established at the present time. Then the corresponding parts are submitted to each state agency which has been entrusted with management of the national economy.

Such, in our opinion, are the contours of "economic" planning. In addition to these, for individual branches of the national economy--such as the fuel and energy complex, transportation and so forth--it will turn out to be necessary to retain special-purpose planning to a greater degree. But it too can be improved, especially with respect to guarantees. To do this it is necessary to clearly establish both the obligations of the state agency when issuing and changing the planning assignment to be concerned about resources for it, and the rights of the enterprises to dispute unfeasible assignments in the higher agencies or with the state arbitration board.

Such planning minimizes the randomness of the market (which cannot be completely eliminated and, incidentally, is not being eliminated even now with special-purpose planning). At the same time it gives room for socialist enterprisingness on the part of labor collectives and opens up broad prospects for the central agencies to exercise strategic control. Naturally, the changeover to this kind of planning requires the corresponding change in other parts of the management system.

Third Question: How Should the Management of Enterprises and Their Self-Management Be Arranged?

Under modern conditions the management of enterprises by the state can and should be based on actually complete cost accounting [khozraschet]. "Cost-accounting" management of enterprises by the state is based on the utilization of equivalent exchange--a necessary and the leading element of the mechanism of economic self-regulation. Its main features are seen as follows.

The means of production, which are a part of state property and under no conditions "abandon" their owner, are transferred to the enterprises for economically substantiated payment, that is, for payment which enables profitable production with effective utilization of these means. This pertains also to land, the payment for which includes rent payments. The determination of a reasonable payment for means of production which is stable and at the same time takes into account changes in the economic market conditions is the main thing in the funding policy of the state.

The fixed capital that is "added" during the process of the development of the enterprise is state property just as the initial capital was. Agreements between the state agency and the enterprise establish the volume of annual or one-time additions to the means of production and the conditions (ordinary or privileged) for payment for them and also, in the event of a production or economic need for this, the reduction of fixed capital. Within the framework of the established volume of fixed capital, the enterprise has the right to independently sell to other enterprises certain means of production and acquire other ones to replace them. This kind of operation with fixed capital is carried out only when it is sanctioned by the state agency.



The enterprises develop production mainly through their own accumulations and state credit, and only in exceptional cases do they use state subsidies.

This provides for an efficient combination of state prices, contractual prices that are approved by the state and free contractual prices, all of which are economically substantiated. The state adheres to a course toward general stability of prices and their gradual reduction for series-produced products, it allows a temporary increase in prices for newly assimilated products, and it decisively put the stop to any attempts to sell products at prices as high as those received by monopolies.

With the subtraction of taxes and collections and also the proportion which the enterprise must deposit for the development of production, the net (newly created) output belongs to the enterprise. The labor collective determines independently the wage level. The state establishes the minimum wage and the relative amount of increments for qualifications. The upper level of wages is not fixed, but incomes that are too high, economically questionable who are capable of destabilizing the market are moderated with a progressive tax.

The strictest contractual discipline is introduced and guaranteed by the state. The negligent producer makes complete reimbursement to the consumer for damages, including lost advantage. A violation of contractual commitments can become the same kind of emergency as a natural disaster--under the necessary condition that the enterprises plan their activity on the basis of contracts. Thus one precludes the imbalance in the production of related kinds of products which one frequently finds under the conditions of special-purpose planning.

The number of employees, like the wage fund, is determined independently by the labor collective. There is an inevitable tendency toward reduction of the number of employees at individual enterprises and a redistribution of the labor force. As is shown by the Shchekino practice, which has not become sufficiently widespread within the framework of the current economic mechanism, enterprises which have extensive independence and are operating under the conditions of complete cost accounting will strive to fulfill production tasks with a minimum number of workers. Does this not bring about the threat of unemployment? No. It would be strange if the absence of unemployment under socialism were based on the fact that enterprises employ superfluous people, without thinking about the assimilation of technical innovations and, on the basis of this, increased labor productivity. Both the fact that there is no unemployment and the fact that the individual values his job comprise the norm under socialism. Of course there is no way to avoid current concerns about redistribution of labor resources and the placement of released workers in keeping with their skills and life goals, and this should be envisioned in the plan for restructuring.

The tendency toward a relative and sometimes even an absolute reduction of the number of employees at individual enterprises is progressive and should not be impeded. This will make it possible even at first to put an end to the shortage of labor resources which, as we know, is largely artificial. There will be an increase in the coefficient of shift work of the operation of

equipment and labor turnover will decrease. And in the future the increase in labor productivity and the increased effectiveness of production will make it possible to conduct social programs for reducing the length of working time and expanding the amount of useful free time of the workers. That which leads to unemployment under capitalism will provide under socialism for the realization of the highest goals of society, which are established in the CPSU Program.

A most important element in the system of management of the national economy is the formation of the production apparatus. It is necessary to provide for a constant change in its structure in keeping with the dynamics of social needs and available resources. In this area expansion of independence also promises favorable changes--with a decisive role played by the state, within the framework of its structural and investment policy.

When it is impossible to provide the necessary products on the basis of existing enterprises the state creates new ones at its own expense, forms labor collectives, and after the start-up period transfers them to operate under the conditions of complete cost accounting.

On recommendations from the state agency or on their own initiative which is approved by the state agency, the enterprises create associations and subsidiary enterprises which are managed on a cooperative basis, or they can also break them up. In keeping with own interests and capabilities the enterprise can belong to several associations at the same time. The production unit is singled out from the enterprise and an independent enterprise is created on its basis by a decision of the labor collective and it is sanctioned by the state agency.

In its structural policy the state achieves the formation of the most efficient system of large, small and medium-sized enterprises, both those which have many profiles and those which are narrowly specialized. The structural questions should be resolved from the standpoint of concern for increasing labor productivity, constructing technological chains that provide for reduced-operation and reduced-waste production, and creating the best social conditions for the workers, but never from the standpoint of branch "security" or the departmental jurisdiction of the enterprises.

When forming the production apparatus the state, especially in its investment policy, strives to have the enterprises, within the administrative framework of the oblast level or economic rayon, maximally augment one another, thus providing for territorial comprehensiveness of production.

Obviously, it is necessary to take decisive measures to be sure that there are no enterprises which have monopolies on particular products. The enterprises which are temporarily operating under these conditions are subjected to increased state control. They do not have the right to establish free contractual prices.

The expansion of the independence of the enterprises and, thus, the responsibility for the decisions they make, the constant testing of cost accounting, and the dependency of the remuneration for the collective and each

worker not on the work "for indicators," but on the results of the work as evaluated by the consumer--all this will create a new situation for collective labor and will require changes in the organization of the management of the labor collective. The workers will have a desire to participate in management, and this participation will become a factor in increasing labor productivity, reducing production expenditures and accelerating technical progress. The foundations of socialist labor discipline in the Leninist sense will be strengthened: as self-discipline, "discipline of fraternal ties." New life will be given to all three kinds of intracollective control: "from above," "from below" and "from the side." Everyone will want to know whether the administration is operating skillfully and is not abusing its position, has not let down the neighboring section and that nobody is hiding his slipshod work behind the overall result. The dependency of the administration on the higher agencies should be augmented by increasing its dependency on the labor collective. It is necessary to "join" it more closely to the labor collective in order to reduce to a minimum the possibility of self-interest and abuse of power. All this should merge into the creation of various forms of production self-control, which is the goal of the Law on Labor Collectives adopted in 1983.

In the event of repeated or one-time, but especially serious violations of state discipline and legislation by the enterprise, the corresponding state agency transfers the enterprise over to complete state control (to use a term adopted in Hungary--sanatorium, that is, conditions for improving health) for a particular period of time (a year or two). The agency replaces the managers of the enterprise and appoints new ones at its own discretion, and the agencies of the labor collective act as consultants.

This is the way the economic mechanism could look at the level of the enterprise--the basic unit of the economic system. The developed forums of that part of the economic mechanism which is included in economic self-regulation not only do not diminish the other part--state management--but, on the contrary, require for their normal functioning that the state play a leading role. It is precisely a leading role, and not involvement in trivia. State management is to a considerable degree management of the mechanism of self-regulation.

Fourth Question: How Should the Structure and Functions of the State Administrative Staff Change Under the Conditions of Expanded Independence of the Enterprises?

The most serious restructuring, obviously, will involve branch management--that subsystem of state management which is directly linked to the enterprises. This, in turn, cannot but bring about equally significant changes in the interbranch and territorial subsystems.

At the present time the national economy is managed at the union level alone by 57 ministries and other branch departments and more than 10 state committees and other interbranch agencies. The narrow specialization of branch departments is inevitably accompanied by a walling off of "their own" branches by invisible barriers. Behind these are the departmental interests which are obvious to everyone. Branch specialization impedes the creation of



enterprises that have technologically, economically and ecologically advantageous productions under the jurisdiction of various branches, it stands in the way of the development and assimilation of scientific and technical achievements which are of an interbranch nature (and these are precisely the ones that mainly revolutionize production), and it weakens if it does not undermine the territorial comprehensiveness of production, rigidly separating objectively unified territorial production complexes by departmental "barriers." Narrowly specialized departments, which cannot manage an enterprise in any other way than by strictly centralized methods, by the very fact of their existence impede the expansion of their independence. They play the role of an intermediary between "their own" enterprises and the consumers of their products, burdening and sometimes distorting the economic ties between the contracting agents with formal indicators (sales volume and so forth) on which they arrange the evaluation of the departments of "their own" enterprises and the general departmental well-being.

Narrowly specialized departments are the result of that period of development when it was necessary to use administrative methods to carry out planned apportionment, with practically complete elimination of economic independence. Now, with intensive production, the bulky system of narrowly specialized branch departments is no longer effective. Moreover there has been a sharp increase in the scale of the national economy--the same kind of apportionment is hardly possible on the proper level. Does this mean that branch management is now generally superfluous? By no means. It is necessary, but it must become essentially different: not narrow, but broad branch management, not direct and on-the-spot, but general and strategic, taking advantage mainly of economic methods (and administrative ones only when necessary). Expansion of the independence of enterprises would be largely meaningless and false if it were not reinforced by a sharp reduction in the volume of branch management and, consequently, the number of branch departments.

For management of a large part of material production (industry, with the exception of individual branches, construction, agriculture) it would be expedient to create a unified ministry of the national economy (conventional title).<sup>2</sup> In our opinion, such ministry, even if it were a gigantic one, still would not be able to cope with managing the immense economy. One can agree with this statement if one has in mind the old way of management. But if one is speaking about the new kind of management, there is no reason why a unified ministry could not cope with this task. While for the old kind of management the breadth of the branch is an insurmountable object, for the new kind of management it is, on the contrary, a favorable barrier since it provides for breadth of interaction and maneuvering.

As a state management agency the Ministry of the National Economy would engage not in on-the-spot management of production and economic activity, but prediction of public needs, planning of material production according to consolidated indicators, legal regulation, the personnel, structural, regional, scientific-technical, investment, capital, tax and credit policies, the policy in the area of prices and standardization, and product quality control.



Would we then not see a "falling away" of the differentiated management of the branches (more precisely, subbranches) of material production which is now handled by narrowly specialized branch departments? Let us try to figure this out.

The present ministries encompass, as a rule, not all of "their own" branch, but only part of it, at best the predominant part (one which produces more than half of the gross branch output). The rest of it is dispersed among other departmental systems. This is explained by the fact that along with narrowly specialized, single-profile enterprises, there are--and this is inevitable--enterprises that are diversified, multiprofile, and the number of these latter is continuing to grow. And this is a progressive tendency if one only speaks not about semiprimitive support industries that grow out of enterprises, but about real diversification, when the basic production is combined in a technologically and economically rational way with other industries and a reduced-operation reduced-waste comprehensive production which is advantageous to the society is formed.

The object of narrow branch management should be not the enterprise, which is most frequently actually or potentially multiprofile and multibranch, but homogeneous productions, regardless of the enterprises at which they may exist. Not automotive plans (which also produce refrigerators, washing machines and so forth), but automotive production, the production of household appliances, and so forth. And the task of centralized narrow branch management will be to ensure a higher level of technical equipment and technology for production, the effectiveness of production and the consumer qualities of the products.

A unified ministry of the national economy will make it possible to organize narrow branch management in the necessary form--as management of scientific and technical progress in the corresponding groups of homogeneous or related productions. To do this, probably, it will be necessary to have as part of the ministry a technical main board which is broken down into subdivisions for the various subbranches of material production and relies on a network of scientific research and experimental design institutions that are under its jurisdiction.

Let us go on to other measures of a structural nature.

It is possible (especially if one retains special-purpose for the fuel and energy complex) to single out from material production the corresponding branches and place them under the jurisdiction of the Ministry of the Fuel and Energy Industry.

Taking into account the immense growth of the volume and social significance of housing and municipal services, including, even if not without reservations, all kinds of communications, and also the need for a unified state policy in this area, one should raise the management of housing and municipal services from the republic to the unionwide level and create a ministry of municipal services and communications.

In order to organize the work of all kinds of transportation as a unified system and to overcome the lack of coordination at the junctures of branches, it is necessary to have a unified ministry of transportation with main boards for the various branches. Additionally it should apparently include a main board which is in charge of shipments (above all comprehensive ones) and has for this its own staff in the transportation centers.

The new planning policy will relieve the Gosplan of planning functions which do not properly belong to it (the development of planning assignments for the various branches in a more concrete assortment than the Gosplan provides). This function (to the extent that it is generally necessary in the formation of plans on the basis of orders from the consumers) will be more convenient for the Ministry of the National Economy to perform. Then the material and technical supply for production will be brought closer to trade. There is a clear close connection between these branches and the activity for procurements and the formation of state reserves. At the state level it would be quite possible to concentrate their management in the Ministry of Supply, procurements and trade. One of the advantages of this measure is the creation of a unified technical supply network of specialized and universal storehouses. Maneuvering their capabilities would largely ease the current difficulties with the storage of material values and would reduce losses.

With a radical concentration of branch management in the Ministry of the National Economy the Gosplan would basically be relieved of functions of current management and would become an agency for general socioeconomic planning, the "general socioeconomic staff" of the state. It would engage mainly in long-range planning of the development of the economy and the sociocultural sphere in their close interconnection and the development and control of the implementation of such comprehensive large-scale programs as the energy program, the minimization of manual labor and regional development (like the program for the development of Siberia). The Gosplan could begin to revise the territorial division of the country, to solve the demographic problems, to restructure the system of education and so forth. It would also be expedient to concentrate in its hands the general management in the area of prices and standards.

Changes in the organization of territorial management ensue organically from the radical concentration of branch management at the statewide level. Management of the republic, oblast, city and rayon national economic complexes is streamlined.

The USSR Constitution establishes the need to combine the branch and territorial principle in the management of the national economy. At the present time the branch principle prevails. Territorial national economic complexes are largely deprived of integrity since they are dismembered and broken into parts by departmental barriers. Enterprises under various jurisdictions pursue "their own" goals which suit the departments. Here they frequently forget about the final national economic and social result and the interests of comprehensive socioeconomic development of the territories, particularly the development of the social, cultural and domestic life which these enterprises themselves enjoy. The creation of agencies for managing the agro-industrial complex not only centrally, but also in the republics and the

local areas is an important step along the path of streamlining territorial management. Now it is necessary to generalize and develop this experience.

It would be expedient to provide for the management of enterprises and other organizations through republic ministries of the same name and then--through local agencies which are under dual jurisdiction: their own departments along the vertical and the local soviet of people's deputies and its ispolkom along the horizontal. It would seem that the direct jurisdiction of enterprises and other organizations to agencies of the oblast and rayon level should be allowed only in rare cases.

With respect to the major part of material production this means that each republic and local national economic complex would have one direct manager, one "immediate" superior--the agency of the Ministry of the National Economy. It would operate within the framework of such a proven form of democratic centralism as dual jurisdiction and would conduct a unified state policy, maximally taken into account the interests of the given national-territorial or territorial community which are authoritatively expressed by the corresponding republic and local agencies.

The changes in the branch, interbranch and territorial management could, of course, turn out to be not quite the way they are presented here on the basis of pure assumption. But they will not be altogether different either. The logic of development does not leave very many real alternatives. As soon as the actual expansion of the independence of the enterprises has come to pass, as soon as questions of current management are solved to a greater degree by the producers themselves within the framework of the mechanism of economic self-regulation and production self-management it will become clear how radical the restructuring of the state apparatus will have to be in order to successfully solve qualitatively different strategic problems.

The restructuring of the economic mechanism in the directions described here already exists in the form of a tendency. It can be traced in a number of measures that have been and are being undertaken by the party and state--such as including in the USSR Constitution the task of further democratization of the Soviet social structure, establishing in the Law on Labor Collectives extensive rights for workers in management, providing all-around support for the brigade contract and other initiatives from below, partially restructuring the management of the agro-industrial complex, conducting the experiment in various branches of industry, and so forth.

Like any large social transformation, the restructuring of the management of the national economy can be carried out successfully in no other situation than the one in which the new fights against the old.

As M. S. Gorbachev noted in his speech at the All-Union Scientific and Practical Conference, "Improvement of Developed Socialism and Party Ideological Work in Light of the Decisions of the June (1983) Plenum of the CPSU Central Committee," which was held on 10-11 December 1984, in the interpretation of the radical and crucial problem of the interaction of modern productive forces and socialist production relations we have "far from fully overcome dogmatic ideas...." The development of the concept of restructuring

the economic mechanism requires above all a revision of ideas concerning the exclusivity and immutability of those forms of planning and cost accounting which have arisen primarily under the extreme conditions of our society's development. At the same time it is necessary to avoid such mistakes as the "erosion" of national (state) property, exaggeration of the dangers of the revival of the "private businessman," and weakening of state control and the centralist foundations inherent in it. The restructuring of the economic mechanism, which meets the needs of developed socialism, should avoid these two extremes.

A special problem is that of changing over from the current economic mechanism to the new one without interrupting the continuity of production. This question will require careful development. It will be necessary to find a weighed and at the same time a simple solution like replacing apportionment with a tax in kind. The basis of this can be the fact that at the present time the compulsory planning assignments of the enterprises are duplicated by the system of economic agreements. Taking advantage of this one can promptly make notification that beginning in the following year "planned apportionment" will be replaced by a system of agreements which will apparently be approved by the state at first. It is clear that for this year and subsequently the enterprises will conclude agreements with a much greater degree of responsibility than now, when it is possible to fulfill the plan and receive bonuses while failing to fulfill contractual commitments. The system of real agreements concluded under the directive influence of the state is capable, in our opinion, of providing for a planned entry of production into new conditions of management which are incomparably more favorable for it.

#### FOOTNOTES

1. KOMMUNIST, No 18, 1984, pp 9-10.
2. Concerning the proposals for improving the work of the branch system of management see also in KOMMUNIST: Popov, G., "The Development of Branch Management of Industry" (No 18, 1982); Belyak, K., "Branch Management of Industry"; Petrof'yants, A., "A Realistic, Well-Substantiated Proposal" (No 8, 1983); Gvishiani, D., "Key Reserves for Management of the National Economy"; Ikonnikov, V., Krylov, F., "On the Combination of Branch and Territorial Management" (No 4, 1984). In EKO: Fedorenko, N. P., "Planning and Management: What Should They Be?" (No 12, 1984); Karagedov, R. G., "On the Organizational Structure of Management of Industry" (No 8, 1983).

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## RESULTS OF ECONOMIC EXPERIMENT REPORTED

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[Article by R. G. Karagedov, doctor of economic sciences, chief of the sector for the economic mechanism, Institute of Economics and Organization of Industrial Production of the Siberian Branch of the USSR Academy of Sciences (Novosibirsk): "The First Results, Problems and Prospects"]

[Text] The economic independence of the socialist enterprise has certain limits, of course. A correct evaluation of the combination of independent decisions on the part of individual labor collectives and centralized planned management constitutes one of the key problems in the theory and practice of management of the socialist economy. The preceding experience in economic construction in the USSR and other countries with socialism shows that the effectiveness of measures for improving management of public production depends largely on how they affect the status of its main cost accounting units--the enterprise.

It is not an easy task to find a reasonable ratio between centralization and decentralization of economic decisions. The principle of democratic centralism in our country is constitutional, but its concrete forms can and should change depending on the peculiarities of the economic period. The overall formula proposed by the theory--centralization of strategic decisions and decentralization of current ones--can be realized only by completely taking into account its specific features.

From this standpoint it is difficult to overestimate the significance of the large-scale economic experiment that is being conducted in our industry. It is directed toward strengthening the economic independence of production associations (enterprises), expanding their rights and increasing their responsibility for the results of their work, and all this relies on the conclusion drawn from the theory of management of the economy of developed socialism. Their experimental testing is now of exceptional interest.

The Institute of Economics and Organization of Industrial Production of the Siberian Branch of the USSR National Economy has become familiar with work under the new conditions at Siberian enterprises of the Ministry of the Electrical Equipment Industry and the Ministry of Heavy Machine Building. It

is too early, of course, to speak about the results of the experiment: the majority of its measures are intended for an effect in the future, although the not-too-distant future. But certain preliminary conclusions and evaluations are still suggested. Generally promising results are in evidence, perhaps, at the majority of the enterprises. At the same time certain difficulties and problems were revealed. Here one could keep in mind that the experiment as such is being undertaken in order to test various hypotheses but not necessarily to confirm them. Its task will be fulfilled whether these hypotheses turn out to be correct or not.

We have set as a goal to evaluate the completeness and the quality of the methodological materials prepared by the ministries, the promptness of the notification of the enterprises of these, the time periods for approving planning assignments and economic normatives--in a word, everything that is included in the concept "starting conditions" of the experiment. There have been more than enough shortcomings here but they too can be explained and eliminated. It is much more important now to clarify, in the first place, how efficiently the realization of the basic goal of the experiment has been earmarked and, in the second place, whether or not one considers the complex of measures being conducted now to be sufficient or if the experiment suggests new solutions as well.

It is already obvious that the experiment has increased the interest of the labor collectives in the results of production and motivated them to mobilize internal reserves. One can state that the evaluation of the quality of the work of the enterprises taking contractual commitments into account has appreciably increased the responsibility for the fulfillment of the delivery plans in the majority of production associations and plants that are being investigated. There has been a sharp increase in the number of enterprises that have completely fulfilled these plans and some of them have met their contractual commitments for the first time in the past couple of years.

A marked improvement of the main evaluating indicator--product sales taking into account the observance of contractual commitments--is being noted in all five of the ministries participating in the experiment in 1984. In 1984 three of them achieved 100 percent fulfillment of deliveries for the first time, and in the other two--the Ministry of the Electrical Equipment and the Ministry of Heavy Industry--the number of completely fulfilled deliveries more than doubled as compared to 1983. We should like for this tendency to be stable. At the same time we must not exaggerate the significance of the figures that have been presented: in the first place, the enterprises participating in the experiment have preference in material and technical supply and transportation and, in the second place, the indicators that have been achieved are explained not only by the conditions of the experiment, but are also conditioned by the overall favorable background for the development of industry in 1984.

All five ministries have fulfilled assignments for increasing labor productivity and have provided for the entire increase in output as a result of this factor (except for the Lithuanian SSR Ministry of Light Industry). The volumes of production of products in the highest quality category are increasing and other economic indicators have also improved. Increments to prices for products in the highest quality category have exerted an

appreciable positive influence for certain enterprises. Without any special difficulties the normative method of forming a wage fund is being introduced; it is the general opinion that this contributes to increasing the motivation of production collectives to step up the growth of labor productivity and to reduce the number of surplus personnel. There are fewer requests for increasing the number of workers (at many enterprises that have been changed over to the conditions of the experiment they have even decreased) and the relative savings on the wage fund have increased. There are greater possibilities of differentiation in wages: many enterprises have taken advantage of their new rights to utilize the savings from the wage fund to establish increments to salaries and wage rates and to pay bonuses (the Krasnoyarsk) Sibtyazhmash, the Barnaul Plant for Transport Machine Building, the Cheremkhovskiy Machine-Building Plant and others). At certain enterprises there have been greater possibilities of technical reequipment of production using their own funds. At Sibtyazhmash, for example, the fund for the development of production doubled in 1984 as compared to 1983, and the Irkutsk Plant for Heavy Machine Building imeni V. V. Kuybyshev took advantage of its right to utilize for these purposes the amortization deductions which were intended for capital repair, in the amount of 268,000 rubles, and the Cheremkhovskiy Plant--44,000 rubles.

The positive changes in the work of the enterprises being investigated is also explained by the general upsurge of economic work brought about, in particular, by the attention paid to the experiment by party and Soviet agencies. An appreciable role has been played by the essential strengthening of production and labor discipline. When preparing for the experiment and during the course of it the production associations, plants and factories do a large amount of work to improve intraplant planning and cost accounting, systems of organization and payment for labor, and bonus provisions, and also for strengthening economic services. The ones that stand out in this respect are the Novosibirsk Elektroagregat and Elektroterm production associations, the Irkutsk Plant imeni V. V. Kuybyshev, and the Divnogorsk Low-Voltage Equipment Plant. We think that in the ministries selected for the experiment there has been justification for the differentiated approach to selecting evaluation and fund-forming indicators, methods of constructing normatives and so forth. The experience accumulated here, although it is not extensive, shows that diverse forms and methods of management, which take into account the specific features of the branch, are not only possible but also desirable.

All these achievements, although they may still be modest, show that the main directions that have been taken for improving the economic mechanism have been correct. They have suggested the expediency of extending the experiment to other branches of industry: in 1985 more than 2 dozen industrial ministries, in addition to the five initial ones, were changed over to the new conditions of management. But the main thing, in our opinion, is the development and deepening of the principles of the experiment in the direction of further strengthening of the cost-accounting independence of the enterprises. In almost all of the enterprises that were investigated the measures of the experiment are regarded from the standpoint of the possibilities they open up for improving production indicators. But at the same time one frequently hears the opinion that the measures that are being taken now are not sufficient to fully overcome the shortcomings left over from the previous



practice of planning and management, above all on the part of branch agencies. Unfortunately, fears of this kind are not without justification. The period that has passed since the beginning of the experiment has shown that there is less consistency in implementing those measures which pertain to the competence not of the enterprises themselves, but of the ministries and industrial associations.

One should apparently consider the main measures of the experiment to be those which envision a considerable increase in the role of production associations (enterprises) in the development of plans--in all stages of planning. The effectiveness of these measures with respect to the five-year plan will obviously be manifested later, when working on the subsequent five-year plan. As for drawing up the plan for 1984, the enterprises that were investigated are noticing appreciable changes mainly in the fact that they are receiving directive assignments and normatives from the branch agencies much earlier than they did before, which essentially facilitates the work on the plan and increases its substantiation. Unfortunately there are not yet any such changes in the procedure itself for the development and coordination of the annual plan--the expansion of the rights of the enterprises envisioned by the experiment is taking place very slowly here. The Sibelectrotyazhmash Plant, having received control figures for the plan for 1984, submitted to the All-Union Production Association proposals substantiated by calculations for certain indicators, but they were not even considered. The annual plan for the Elektroagregat Production Association was drawn up without its participation, and it was submitted in September of the preceding year, after which it was changed 12 times--as of March 1984. Proposals for the annual plan of the Minusinsk Electrical Equipment Complex were not given any attention by the higher organization. In April 1984 this association had not yet received the annual plans for capital construction or technical reequipment or certain economic normatives (including for forming the wage fund); by that time they had not yet approved the main evaluating indicator either--product sales based on commitments for deliveries--and approved assignments for production costs and labor productivity were repeatedly adjusted. The Divnogorsk Low-Voltage Equipment Plant during the first quarter of that same year changed the assignments of labor productivity three times, and the last time was on 29 March, after the collective agreement had been concluded. Other enterprises of the electrical equipment industry also complain about these problems as to enterprises of heavy and transport machine building which are located in Novosibirsk, Irkutsk and Kemerovo oblasts, Krasnoyarsk and Altay krais.

There is a natural desire to chalk these cases up to the experience of the first year of the experiment, but the situation has not changed for the better even when developing the plan for 1985. The Sibtyazhmash Production Association received the plan assignments for the products list somewhat earlier than before--in June 1984. The calculations and justifications for the enterprise were sent to the Soyuzmetallurgmash VPO in August, but they were not given any attention, and in October the previous variant of the plan was delivered, and it contained both approved and calculation indicators. In December Sibtyazhmash again notified the VPO about the latter's increase in the assignments for commodity output by 2.1 million rubles, and the normative net output--by 2.2 million rubles, but these calculations were ignored as



well. At the same time the approved volume indicators, as before, were not coordinated with the plan for the products list. In November they nullified six orders for cranes, and four of them were envisioned in the plan for the first quarter of 1985 and were completely ready.

The Divnogorsk Plant for Low-Voltage Equipment received certain planning indicators for 1985 in October of 1984, that is, even later than in the preceding year. The plan for the products list was received in September instead of April, which impeded the normal campaign for orders. The proposals of the plant were taken into account by the higher organization to an even lesser degree than the year before. At the beginning of January the plant had not yet been given the financial plan or the plans for new technical equipment, capital construction and repair. Because of this, the work for concluding agreements was disorganized. The planning assignments submitted to the plant are established by various divisions of the VPO and frequently are not coordinated with one another.

Nor was there any change for the better when the 1985 plan was drawn up in the Sibelektrotyazhmash Production Association. The control figures for the plan were received from the VPO in October 1984, and the assignment for reducing production costs was set in the amount of 3.74 percent, although for the five-year plan it was intended to be 1.16 percent and according to the calculations of the association--0.22 percent. As before, it was given the calculation indicators for the plan, the number of technical services, instrument shops and so forth. The higher organizations did not take into account the calculations of the Sibelektroterm Association either. Thus the collective of the association considers it unsubstantiated to include in the plan for the first quarter of 1985 a DSP-100 46 electric furnace with a production cycle of 8 months; the metal and other materials for this furnace were not allotted on time.

It is premature to speak now about the increase in the role of the five-year plan that is envisioned by the experiment. Today many enterprises do not have a stable five-year plan or sometimes even a two-year plan. It sometimes even happens that they do not have a firm annual plan. In this respect the experiment has not brought appreciable improvement yet. The changes, and significant ones, are noticeable in other areas: the number of directive indicators of the plan has decreased. But it is still too early to judge how much the actual rights of the enterprise have increased because of this. The fact is that the higher organizations, primarily the branch organizations, require reports on the entire range of indicators just as they did before, practically without dividing them into directive indicators and calculation indicators. Among such organizations are, for example, the Soyuzvagonmash and Soyuzmetallurgmash VPO's. In addition to everything else the latter established for the Krasnoyarsk Sibtyazhmash calculation indicators of the plant for 1984 even though these were to have been calculated by the enterprises themselves. And the Minusinsk Electrical Equipment Complex instead of the normative for the formation of the wage fund received from its VPO the calculation indicator of the sum of this fund. There was an obvious violation of the conditions of the experiment in relation to the Altay car construction plant: it was "notified" from above of the wage fund and other calculation indicators (number of personnel, average wages).

The inertia of the old style of management impedes further development of the experiment and imposes the previous practice of "voluntary" planning. At some of the enterprises that were investigated one found the same divergences between the volume and the products assignments of the plan, a lack of balance between the production program and existing capacities, and "incompletely delivered" funds for material resources. The Novosibirsk Elektroterm is faced with the previous difficulties in forming a balanced plan: in 1984, according to the estimate of specialists in the association, the assignment for producing welded pieces were increased 1.5-fold. The Southern Ural plant of the VPO under a "voluntary" policy doubled the production volume--from 3.5 to 6.5 million rubles. The differences between the established overall volume of production and this same indicator obtained by subtracting from the approved products list in 1984 amounted to 3.5 million rubles at the Minusinsk Complex, 3.5 million rubles at the Prokopen Elektromashina Plant, 1 million rubles at the Sibtyazhmash, and 1.3 million rubles at the Altay Railroad Car Construction Plant.

The need for material resources is not always fully satisfied either. There were shortages of them--to various degrees--in the 1984 plan at practically all of the plants that were investigated, and an especially difficult situation was found at the Irkutsk Plant for Heavy Machine Building imeni V. V. Kuybyshev, the Kuzmashzavod, the Cheremkhovskiy Machine-Building Plant and the Angarskiy Electrical Equipment Plant, Kuzbasselektromotor and Sibelektrotyazhmash. The majority of enterprises are not noticing appreciable changes in the organization of material and technical supply: as before, there is no coordination of the time periods for drawing up orders for resources and production plans, as before, it is difficult to "pledge funds for capital; frequently they are let down by the suppliers of ferrous metallurgy--according to the estimates of certain plants they have not improved their work. At the same time one cannot but note that supply agencies have conducted and are conducting a large amount of work for creating preferential conditions for the supply of the enterprises participating in the experiment. This has been felt, in particular, in the Elektroagregat Association and the Elektromashina (Prokopenvsk), Abakanvagonmash and Irkutsk Kabel' plants. But one must keep in mind that as enterprises of other branches are changed over to operating under the new conditions these privileges will no longer exist.

An important position in the experiment is assigned to increasing the role of economic normatives as levers whereby the plan can influence the economic activity of the enterprise. The main idea here is that the amounts of the funds for wages, social development and improvement of production during the entire five-year plan have depended on the final results of the work. Therefore it has not been stipulated that the normatives established in the five-year plan are not subject to change. It must be recognized that practice has somewhat deviated from these requirements. The unified (in any case for Siberian enterprises) normative for the formation of the wage fund established by the Ministry of the Electrical Equipment Industry for 1984 did not fully take into account the concrete working conditions at Elektroagregat, Sibelektrotyazhmash, the Divnogorsk Low-Voltage Equipment Plant, the Leninsk-Kuznetsk Electric Light Bulb Plant and other enterprises. The Divnogorsk

workers, for example, submitted calculations that proved that they were short a half-million rubles on their wage fund. The changes that had been made at 10 different times in the production plan for the Elektroagregat Association--from November 1983 through March 1984--were augmented by two more revisions of the normative for deductions from profit into the fund for the development of production, and as a result it was reduced from eight to 5.9 percent. In the financial plan the VPO established for the Kemerova Electrical Mechanics Plant the sum of the fund according to the normative of 7.5 percent, that is, it actually reduced the latter which had been approved in the amount of 7.7 percent. But if the economic normative is not coordinated with the enterprise and is not stable, it ceases to meet its purpose.

Now about measures which are intended to expand the rights of the enterprises in raising the technical level of production and to increase their motivation to introduce scientific and technical achievements. It is still too early to judge how effective they have been. Their influence can be fully manifested only after a year or two. But still the first impressions put us on our guard: at the enterprises that were investigated the restructuring of economic activity in this area is encountering great difficulties. First of all, they are not vigorous in implementing the decisions concerning material and technical support for work for technical reconstruction through the internal funds of the enterprises. This is especially noticeable when one becomes familiar with the situation in the Elektroagregat and Minusinsk Electrical Equipment Complex associations, the Sibelektrotiyazhmash, the Electric Lamp (Leninsk-Kuznetskiy), Elektromashina, Kuzbasselektromotor and other plants. At Elektroagregat, for example, there is a critical shortage of construction capacities and construction materials. Even with a firm plan, the metal, cement and other materials, as a rule, are not allotted nor are funds for local materials (brick and so forth). And in 1984 the exchange of material resources was essentially limited. The association has no long-range plan for technical reequipment, and in the estimation of its managers this is to a considerable degree because of the position of the VPO, which is not considering the proposals for specialization, mechanization and automation of production. Sibelektrotiyazhmash also points out the lack of real coverage for the work that is carried out using the fund for the development of production. The shortage of construction capacities explains why the rights of certain enterprises participating in the experiment are not regarded as real and particularly for housing construction using money from the fund for social and cultural measures: for Sibelektrotiyazhmash the ministry "cuts" orders for this kind of construction, usually by half, but even then the plan is only being fulfilled by 50 percent.

In 1984 the expansion of the possibilities of obtaining bank credit for new technical equipment remained theoretical: they did not "manage" to include this source in the annual plan for capital investments. Many enterprises note that the expansion of their rights to utilize the centralized sources of capital investments is only formal in nature. Branch management agencies have found indirect levers for limiting these rights: limiting the funds for technical reequipment, reducing the corresponding allocations under the financial plan, retaining the previous policy for allotting equipment and other resources. Serious complaints of this kind are expressed by the Kuzbasselement, Elektromashina and Kemerovo Electrical Equipment Plant.



Incidentally, for some incomprehensive reason the VPO has taken away from the latter the financial reserve which was created in the first quarter of 1984 in keeping with the new provisions.

All these facts lead us to the conclusion that the realization of the rich possibilities inherent in the experiment is being impeded by the style and methods of operation of the branch management agencies. This tendency is doubly undesirable. It threatens to direct the experiment along the path of unilateral (only from the side of the enterprises) restructuring of the economic mechanism, which does not involve the middle level of the system of management, and is therefore incapable of producing the necessary effect. Moreover, in the enterprises it can generate a lack of confidence in the possibility of expanding their rights in the area of planning and economic activity. At several of the plants that were investigated even now one finds people who think that it is inevitable that the long-term economic normatives will be revised and hence also the practice will be retained of drawing up "cautious" plans which are not oriented toward revealing all intraindustrial reserves.

It would be wrong, however, to reduce the problems raised by the experiment to the rates of restructuring of the work methods of branch agencies. It would be more correct to say that under the new conditions of management one reveals more clearly the bottlenecks not only in the organizational structure, but also in the entire mechanism for management of industry, above all in those units in which the realization of the central goal of the experiment encounters the greatest difficulties. It has been revealed, in particular, that an important condition for normal operation of the enterprises which enjoy extensive economic independence is balance of the national economy, and in order to raise its level it is necessary to have constant improvement of the quality of planning, better systems of material and technical supply, price setting and so forth. But, after all, it is precisely this kind of restructuring that is presupposed by the economic experiment. So the difficulties and problems that arise for enterprises participating in it can be generated mainly by the slow implementation and, which is more important, by the inadequacy of the measures that are now being conducted. This means that it would be expedient to augment them with new ones, in the same direction, but more radical ones. In our opinion, consistently realizing the main goal of the experiment--an essential strengthening of the cost-accounting independence of the enterprises--requires a decisive redistribution of management functions among the various levels and units of the system of management.

If one recognizes these conclusions as fair one can see two possible variants of the development of the experiment. The first of these, which seems to be making its appearance in practice, indicates a strengthening of the already accumulated experience as a whole and a gradual extension of it to all of industry and several related branches. This variant also includes new, additional measures for improving the existing mechanism, but these, like those that have already been conducted, do not affect the principal peculiarities, that is, they protect not only the main merits, but also the shortcomings. Among the new measures the most desirable are the following:



to prohibit assigning the enterprises any kind of indicators and limits that are not envisioned by the conditions of the experiment and to demand unwavering observance of the decisions concerning reducing the range of directive assignments of the plan. It would be expedient to limit the number of these indicators to two or three;

to exclude from these indicators the normative net output. Experience bears witness to essential shortcomings in this indicator (at any rate as an evaluative indicator) when it is separated from actual economic circulation. Incidentally, the practice of planning in a number of European socialist countries gives preference to the indicator of the actual net output.

The system of material and technical supply should be reorganized, at least partially. The main areas for solving this problem are the organization of wholesale trade in products for production and technical purposes and a reduction of the proportion of funded circulation (and, correspondingly, of the supply apparatus). The enterprises must be granted the unconditional right to exchange resources they do not need, including funded ones.

There should be consistent implementation of the decision concerning the normative method of distributing profit among enterprises participating in the experiment.

The rights of the enterprises should be expanded in the area of price setting--primarily and preferentially in branches that produce consumer goods and render services to the population.

The system of sanctions for violation of the conditions of economic agreements should be strengthened, basing it on the principle of complete compensation for harm that is caused.

It is necessary to increase the role of the fund for the development of production in the technical re-equipment of enterprises: to increase its proportion in the sources of financing capital investments, to solve the problem of coverage with material resources and, the main thing, to grant the enterprises a real right to make independent investment decisions.

It is necessary to consistently implement the decisions concerning deductions of a fixed part of the growth earnings which should be placed directly at the disposal of exporting enterprises.

As an exception and a new experiment, individual leading production associations which have qualified management and have achieved high economic indicators should be changed over to special operating conditions, which means essentially greater rights to independent economic decisions than the other enterprises have.

Another variant of the development of the experiment presupposes a one-time approach to the second stage of it for all industry and related branches of the national economy. The central idea of this stage is the same as before--expanding the rights and increasing the responsibility of production collectives--but it is implemented much more decisively, with the help of more

radical means. The general concept of this scheme of management, as before, proceeds from the idea that in the management of the socialist economy a leading role is to be played by the centralized planning basis. But this is not equated to centralized management of the economy by direct administrative methods alone. The management with the help of economic levers is also essentially centralized. Both of these forms of management have their merits and shortcomings, but the greatest total effect is achieved when they are effectively combined. This requirement is actually expressed by the Leninist thesis concerning democratic centralism in economic management.

The economic levers for management evaluated from these positions act as means that make it possible to utilize the advantages of democratization. These advantages are great and diverse and they are the more significant, the greater the scale of the system that is being managed. The main one of these consists in that granting cost-accounting enterprises the right to independent decisions means for them a real possibility of manifesting economic initiative. In order to constantly increase the effectiveness of the production it is necessary to have an economic mechanism which not only motivates labor collectives to improve the indicators of their work, but also creates economic and institutional conditions which make it possible to materialize this interest. These conditions also provide for democratization of the economic management and strengthening of the cost-accounting rights of the enterprises. When the economic mechanism is properly arranged, and the interests of the society and the production collectives are brought closer together, the interest of the latter is directed toward fulfilling the unified national economic plan. In this case the economic levers of management become effective regulators of economic life which augment direct influence on it by the state and mobilize large additional reserves for accelerating economic growth.

The cost-accounting rights of the enterprises, of course, are not the same in various areas of production and economic activity. The achievement of certain of the most important goals of the economic policy of the socialist state cannot be made dependent on the action of the commodity and monetary mechanism; it requires directive methods of planning and administrative control. This is most necessary in those key areas of the economic mechanism which regulate the investment process and personal incomes--here is where the rates of growth are determined as are the branch structure of public production, territorial proportions, the development of the infrastructure and the conditions for protecting the environment as well as the standard of living for the population. It is obviously expedient for the state to regulate foreign economic and currency-financial activity, although even in these spheres the area of independent decisions of cost-accounting production organizations can be appreciably expanded. In brief, the reasonable limits of cost-accounting rights of enterprises is obviously closely dependent on the branch to which they belong and other concrete conditions of their operation.

The possibility of manifesting economic initiative is perhaps the main condition for creative enrichment of labor, above all administrative labor, and a considerable increase of its productivity on this basis. This is an exceptionally important and inexhaustible source of development and improvement of production. In our opinion, it is precisely here that one

finds a bottleneck in the economic mechanism and "widening" it requires shifting the center of gravity from the area of administrative methods in the direction of economic levers. The initial condition for this rearrangement is to grant the enterprises the real right to select economic decisions.

It should be recalled that the expansion of the rights of cost-accounting enterprises is certainly not a goal in itself. It is necessary to the extent that it makes it possible to unleash the initiative of the labor collectives. And in order for this initiative to be directed in the interests of the entire national economy, it is necessary to have a system of economic levers of management. Therefore expansion of the independence of the enterprises is expedient only in combination with a strengthening of these levers and an essential increase in their role in the entire system of economic management. This means that the task of expanding the rights of cost-accounting enterprises should be resolved not in isolation, but during the course of a comprehensive restructuring of the existing mechanism of economic management. This kind of restructuring is also proposed in the second variant of the development of the experiment. It inevitably affects the organizational structure of management: real strengthening of the economic activity of the cost-accounting unit of production requires, first of all, a redistribution of the functions, rights and responsibilities among these units and the higher economic management agencies.

The outline for economic management proposed in this variant is basically in two units and includes central agencies and production associations (enterprises). These agencies include functional ones (Gosplan, System of State Committees and so forth) and linear ones (the ministries of Industry, Agriculture, Transportation and so forth). The first peculiarity of this system lies in the fact that with certain exceptions it has no place for the current branch (actually subbranch) ministries, industrial associations and other organizations which are analogous to these of the so-called "middle level." The functions they perform for operational management of production and economic activity of the enterprises are transferred to the latter. The second peculiarity is that the activity of the central planning and economic agencies and the branch and territorial agencies that are retained is concentrated in the long-range development of the national economy, and the development and implementation of the economic policy of the state--mainly with the help of economic levers. Compulsory assignments are established for a limited number of branches which are involved in achieving the most important sociopolitical goals of the state. Such assignments are also necessary when large structural changes are made in public production and as a means of forcing priority directions of scientific and technical progress. And in the rest of production management economic methods prevail.

In this model the primary units of production operate under complete cost accounting. It is complete in the sense that, in the first place, the area of their independent decisions is limited only by the existing economic legislation--financial, labor, ecological and so forth. The economic normatives established by the management center, of course, also serve as limitations; they are included in the long-range plan for economic and social development. In the second place, complete cost accounting means real economic (and not just administrative) responsibility on the part of the



production enterprise for the results of the economic decisions that are made. All indicators of the plan--both current and long-range--are determined taking into account the economic agreements, economic normatives and a small number of compulsory assignments, by the enterprise itself. The rejection of excessive regulation of its economic activity is possible because in the proposed system manifests internal limitations which established the area of decisions on the part of cost-accounting collectives which are effective from the national economic standpoint even though they are independent. These limitations can be, above all, the requirements of complete self-payment and profitability, and all expenditures--for current production and expansion--are covered from the income of the enterprise itself. Ineffective decisions which reduce these incomes place in question the very possibility of continuing its activity, that is, the existence of the enterprise. Such an economic mechanism not only allows, but even presupposes accelerated development of effective enterprises and the curtailment of the activity of unprofitable ones.

Complete cost accounting includes granting economic organizations rights to independent investment decisions. For without this there can be no real independence in the area of current production or raising of the level of technical supply. Planned development of public production requires, of course, concentration by the state of a considerable part of the overall fund for capital investments, which provides for the active structural policy, the needs of the production and sociocultural infrastructure and so forth. As for existing enterprises, it is not only possible, but also expedient to make their expansion dependent on their economic results. In the system that is described the fund for capital investments is divided into two parts, and one of these is used by decisions of the enterprises themselves. The state can also participate in these capital investments--for purposes of influencing the enterprises' investment policy. It is also possible to have the reverse situation: the utilization of the funds of the cost-accounting enterprise for financing state capital investments if it is motivated to do this.

In the variant of the deepening and development of the experiment which is under consideration the funded distribution of money for production is reduced to a minimum of positions which provide for those state needs whose primary satisfaction requires unconditional guarantees (defense, intergovernmental commitments and so forth). But the main method of handling these products is becoming wholesale trade, on the basis of direct contractual commitments between the suppliers and the consumers, in the majority of cases, apparently, with the mediation of specialized supply and sales organizations.

It is also becoming expedient to expand the rights of enterprises in questions of price setting: excessive centralization in this area impedes the strengthening of cost accounting. It limits the sphere of independent decisions and, moreover, leads to a prevalence of the so-called "expenditure" principle in the formation of prices, whereby calculations of the economic effectiveness of economic measures are made significantly more difficult. For this principle means that from the well-known two groups of price-setting factors which lie on the side of production (supply) and the side of the consumer (demand), only (or mainly) the first group is taken into account. And therefore one frequently ignores the interests of the consumer and he does



not have enough influence on the process of price setting. It is precisely this circumstance that is the source of many interruptions in the work of the economic mechanism.

We are speaking, of course, about a reasonable degree of decentralization of price setting. As in other areas of economic management, the greatest effect here is achieved with a rational combination of centralized planning and independence of the cost-accounting units of production. For the proposed variant of the development of the economic experiment one can formulate two main tasks in the area of wholesale prices. First, one must reduce to the necessary minimum the list of products for which prices are established centrally. For the majority of kinds of products and services the prices can be determined by an agreement between the producer and the consumer under the methodological guidance and control of the state price-setting agencies. In the second place, it is necessary to have a gradual changeover to possible accounting through internal prices for the level and the price ratios on the world market--in order to create additional stimuli to increase the effectiveness of production through increasing the ability of domestic products to compete. The orientation toward prices on the world market is an important condition for properly including the national economy in international division of labor and obtaining the corresponding economic advantages from this. This condition, as we know, is already being taken into account not only by many socialist countries, but also in the practice of economic interrelations among these countries, including the USSR, within the framework of the CEMA.

Cost-accounting enterprises will be sensitive to world prices under the condition that they have the necessary independence in the area of foreign economic activity and bear economic responsibility for it. In our opinion, this activity, following the example of a number of socialist countries, should be included in a unified system of cost accounting which envisions the establishment of currency coefficients and the keeping of a unified profit and loss account by the cost-accounting organizations (taking into account the currency earnings and expenditures for importing).

Under the conditions of extensive economic activity of the enterprises there is a sharp increase in the role of financial and credit levers of control. They become important implements of the state economic policy which provide for planned proportions in the distribution of national income and thus determine the growth rates, the branch and territorial structure of public production, and the ratio between the consumption and accumulation funds--in keeping with the projections of the plans for the country's economic and social development. These include above all the tax policy of the state which establishes centrally the normatives of payments into the state budget from the profit of the cost-accounting enterprises. These norms should obviously be arranged according to the principle of progressive income taxes in combination with payments of the type of real property taxes (payments for resources). The credit system plays a greater role in implementing the state policy for capital investments through regulating the conditions and forms of credit and conducting a certain interest policy. These same methods can and should be applied for short-term credit, thus providing for the distribution

of the supply of credit resources in keeping with the proportions of the development of the economy earmarked by the national economic plan.

Let us sum up a few results. The cardinal problem of managing the socialist planned economy is an efficient combination of centralized management and economic independence of the production of organizations. The latter should now be decisively expanded--this will serve as an initial condition for an essential strengthening of the economic initiative and interest of the labor collective and their managers to considerably increase the effectiveness of production. The 26th Party Congress and subsequent plenums of the CPSU Central Committee oriented the work for improving the economic mechanism precisely in this area. In this area also lie the main measures for changing over to real cost accounting.

The task of strengthening the economic rights of the production associations (enterprises) cannot be resolved in isolation, in separation from the broader tasks of restructuring the economic mechanism. The required organization inevitably affects all main units of this mechanism, and its overall direction--we emphasize this again--is democratization of economic management.

From this standpoint the large-scale economic experiment that is being conducted in industry act as an important link in the chain of measures necessary for solving the aforementioned problems. The experience that has been accumulated during the course of the experiment is rendering essential assistance in the practice of economic management and thus--in all work for increasing the effectiveness of socialist production.

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## PLANT ECONOMIST EVALUATES EXPERIMENT

Novosibirsk EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA (EKO) in Russian No 5, May 85 pp 100-101

[Article by Ye. S. Sobolev, candidate of economic sciences, deputy general director for economic problems of the Khar'kovskiy Elektrotekhnicheskiy Zavod Association: "The Opinion of a Plant Economist"]

[Text] Our association has been operating under the conditions of the economic experiment since 1 January 1984. In this connection special attention has been devoted to the formation of a portfolio of orders, production planning and its balance with material and technical support, and prompt preparation of production for new items. It was not easy to solve these problems under the specific conditions for the operation of the association. The difficulty lay in the fact that each year it produces approximately 100,000 varieties of types of various kinds of electrical equipment. The association concludes agreements to manufacture these products with more than 8,000 clients. To manufacture these products it uses 120,000 kinds of batching items, raw materials and processed materials, which come from 760 supplier plants. In this connection a great deal of significance is attached to the activity of the Gosnab agencies.

The association's work under the new conditions has revealed serious shortcomings in the organization of material and technical supply. Moreover questions have arisen which require solutions by higher organizations. The lack of coordination in the work of the USSR Gosnab agencies and the enterprises sometimes leads to interruptions in production. Thus on 16 December 1983 Khar'kovglavsnab did not allot funds for 15 various kinds of materials and the Ministry of the Electrical Equipment Industry--for 24 parts of the production program for 1984. Even in March of 1984 these organizations had not allotted the funds for items 2 and 14, respectively. It is therefore not surprising that in the first month of work under the new conditions the association's collective, because of the party supply with dynamic steel and batching items, did not manage to fulfill the state plan for January 1984. The clients fail to receive products under contracts valued at a sum of 807,000 rubles.

Under the new conditions one feels especially sharply the need for an organizational restructuring of the USSR Gosnab agencies. It is necessary to

increase their responsibility for prompt material and technical supply for the enterprises in all of the areas assigned to them.

While before 1965 material and technical supply agencies and the enterprises they served were under the jurisdiction of a single manager and took joint responsibility for the fate of the state plan, now this tie has been broken. Today it is difficult to say who is responsible for prompt and complete material and technical supply for the enterprises.

The ministry is not responsible because it does not engage in the assignment of funds, and the Gosplan agencies, particularly the territorial administration, is not responsible because it does not answer for the production plans of the enterprises and its operation is evaluated according to quite different indicators. Let us assume that the work of both the USSR Gosplan agencies and the enterprises were evaluated taking into account the fulfillment of contractual deliveries according to an assigned products list. The system of material incentives for the workers of territorial administrations of the USSR Gosplan should be linked to this indicator.

Gosplan agencies and their shareholders are continuing to fill out group funding orders for the manufactured products (especially for large electrical machines) without a well-developed assortment. This leads to excessive correspondence with the clients and also to tardy conclusion of agreements and orders for batching items.

The Gosplan and the shareholders should, in our opinion, fill out fund orders according to the "Special Conditions for Deliveries of Electrical Equipment Products," that is, for equipment for individual use they should submit schedule orders after the technical specifications have been coordinated with the supplier and the consumer.

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## PRIVATE AUTOMOBILE PRODUCTION DISCUSSED

Novosibirsk EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA (EKO) in Russian No 5, May 85 pp 102-105

[Article: "The Private Automobile Is Not a Private Affair"]

[Text] Our country began to produce the first passenger vehicles of domestic design (NAMI-1) in 1927. By the beginning of the 9th Five-Year Plan the fleet of passenger cars amounted to little more than 1 million. The situation has changed sharply since the beginning of the 1970's when in Tollyapti, Moscow and Izhevsk they began mass output of passenger cars. About 80 percent of them are sold on the domestic market which, naturally, has brought about a rapid growth of the fleet of motor vehicles for private use: during 1970-1984

Table 1--Number of Private Automobiles Per 1,000 Residents\*

	<u>1970</u>	<u>1975</u>	<u>1980</u>	<u>As of 1 Jan. 1984</u>
USSR as a whole	5	16	31	40
Estonian SSR	20	47	79	97
Lithuanian SSR	10	35	69	84
Latvian SSR	13	33	61	73
Georgian SSR	11	26	49	55
Armenian SSR	9	23	40	48
Ukrainian SSR	6	16	30	40
RSFSR	5	15	30	39
Turkmen SSR	3	15	34	39
Kazakh SSR	5	15	29	35
Belorussian SSR	3	12	25	34
Tajik SSR	3	10	23	29
Uzbek SSR	3	11	25	33
Moldavian SSR	3	10	22	31
Kirghiz SSR	4	13	25	29
Azerbaijan	5	14	24	27

\* Figures for 1970-1980; see: Arrak, A. "Sotsial'no-ekonomicheskaya effektivnost' pasazhirskikh perevozok" [The Socioeconomic Effectiveness of Passenger Transportation], Tallinn, "Eesti raamat", 1982, p 142.

it increased eightfold. According to calculations of the Scientific Research Institute of Automotive Transportation of the RSFSR Ministry of Transportation, the overall passenger turnover per passenger vehicle has increased almost tenfold since 1970. About 10 percent of the automotive fuel consumed by all of the country's transportation goes for the needs of automotive transportation that belongs to private citizens.

Remarkable qualitative changes are also taking place in the development of passenger automotive construction. The Volga automotive plant has created the advanced model VAZ-2108 which embodies new technical decisions and is not related directly through design and technology of manufacture to the models that are being produced at the present time. Mass output of this new generation of car is beginning in 1985. A principally new model, the Moskvich-2141, has been developed and approved, and its production will begin at the AZLK in 1986. Both of these designs have front-wheel drive. The new ZAZ-1102 vehicles will be produced by the Zaporozhye automotive plant. Experimental models of these cars have undergone testing and they are being prepared for production.

Table 2--Distribution of Passenger Turnover by All Kinds  
of Passenger Vehicles, %

<u>Passenger Vehicles</u>	<u>1970</u>	<u>1983</u>
Bus routes	72.9	38.6
Private automobiles	9.9	29.4
Departmental buses	8.6	19.7
Ordered buses	4.3	8.5
Taxis	2.2	2.0
Company cars	2.1	1.8

But the rapid increase in the use of automobiles is also accompanied by a number of negative phenomena. The main ones are the backwardness of automotive service, the fact that the production of spare parts does not meet the demand, and that garage construction has not been arranged. One can also name other problems which make the operation and repair of cars a heavy burden on their owners. The question of the development of automotive service was considered in December 1982 in the Politburo of the CPSU Central Committee. Measures were envisioned for increasing the production of spare parts and introducing automotive service stations as quickly as possible.

The automobile is not simply one of the durable goods. The mass use of motor vehicles in the country brings about a multitude of problems--social, urban construction, ecological and so forth. And the solution to the problems not only for today, but also for the future depends on a determination of the optimal quantity and ratio of motor vehicles that are produced in various classes, the prices and the demand for them, the "ceiling" on the saturation with motor vehicles, their efficient utilization, the formation of an automotive service system not only in the direct understanding of this word, but also as a complex of services--briefly, on an efficient policy for the introduction and use of motor vehicles. This is why it is now so important to

have scientific research and predictions in this area which will help to avoid the difficult aspects that accompany the introduction and use of motor vehicles.

Table 3--Results of Questionnaire of Car Owners in RSFSR,  
% of Number Questioned\*

<u>Needs</u>	<u>Satisfied</u>
Acquisition of spare parts, tires, equipment	35
Service of automobile in garage, paid parking lot or service station	25
Service of cars on the road for breakdown or accident	15
Possibility of servicing one's own car, obtaining tools and advice	**
Washing of car	20
Obtaining of space in garage or paid parking lot	35
Acquiring driving skill	0
Tourist trips and roadside services	25

\* Questionnaire conducted by NIIAT.

\*\* Figure omitted in original.

Our country was relatively late in entering on the path of mass production of passenger cars. In a number of capitalist countries (Canada, Australia, Sweden, France and England) the provision of passenger cars has exceeded 300 vehicles per 1,000 residents, and in the United States this level is more than 500 vehicles per 1,000 residents. This level is also higher in other socialist countries than it is in ours: Romania--about 100, Czechoslovakia--160 and the GDR--170 motor vehicles per 1,000 residents (the USSR--40). These countries have accumulated experience, both positive and negative. Therefore when predicting the stages of the introduction and use of motor vehicles in our country we must take this experience into account.

The selection of materials offered here reflects far from all of the problems that are bothering car owners (even a simple list of them would take up too much space). The editorial staff is hoping to attract the attention of interested organizations to these problems, which in one way or another, frequently through direct effort, are being solved by tens of millions of car owners and approximately 20-30 million members of their families.

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## EFFECT OF AUTOMOBILE ON FAMILY STUDIED

Novosibirsk EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA (EKO) in Russian No 5, May 85 pp 106-117

[Article by G. N. Andriyenko, All-Union Scientific Research Institute for Studying Popular Demand for Consumer Goods and Market Conditions of the USSR Ministry of Trade (Moscow): "The Passenger Car in the Family"]

[Text] The use of automobiles as private property in daily life is gradually becoming just as customary as the utilization of other technically complicated durable goods. At the beginning of 1985 the supply of these for the population amounted to 14 automobiles per 100 families.

### The Automobile and Commodity Turnover

The introduction and use of automobiles among the population have made essential changes in the structure of retail commodity turnover in state and cooperative trade. Thus, according to our calculations, the proportion of passenger cars and the goods and paid services that accompany them in retail commodity turnover of nonfoodstuffs, which amounted to little more than 1 percent in 1970, had increased to almost 10 percent by 1984, with a 25-fold absolute increase in commodity turnover in this group.

This is related to many factors, including the high growth rates of the income of the population, particularly certain groups, and also the achievement of a relatively high level of provision of many kinds of durable goods which are necessities (television sets, refrigerators, washing machines and so forth), which has made the demands for private automobiles one of the pressing ones. Moreover there has been an increase in the proportion of more comfortable and, consequently, more costly models. The fact that the retail prices for passenger cars and accessories were raised in order to achieve greater balance between supply and demand also played a certain role, as did the increased cost of services for technical maintenance and repair.

The mass introduction and use of motor vehicles does more than bring impressive sums of money into retail commodity turnover as a result of the sale of passenger cars. A stable, constantly expanding market is being created for used cars, spare parts, components, sets of equipment, fuel and lubricants, rubber items, automotive accessories, garage equipment, and



service and repair. Calculations show that the cost of accessories and services consumed while operating an automobile exceeds the cost of its acquisition by 2-2.5-fold. Moreover, as the results of a special selective investigation conducted by the VNIKS showed, the use of the automobile as the means of organizing recreation creates a need for a number of goods which are not purely "automotive." Thus 26 percent of the car owners who were questioned consider it necessary to purchase a tent, 24 percent--an air mattress, 13 percent--sleeping bags and so forth, including a total of 40 of the most varied kinds of goods. Thus the introduction and use of automobiles under the conditions of the growing incomes creates prerequisites for drawing additional commodity resources into commodity turnover, and, moreover, it contributes to achieving balance between the overall consumer funds of the population and the commodity resources, between supply and demand.

#### The Problem of the Private Automobile

The growth of the fleet of passenger cars inevitably brings about an increased demand on the part of the population for spare parts, repair and servicing. One of the main factors which determined this demand is the age structure of the fleet.

In spite of the expectations of the management of the Ministry of the Automotive Industry,<sup>1</sup> passenger cars belonging to the population are practically never written off, regardless of their age. With an average age of the fleet of 7 years, the structure is as follows: passenger cars that have served for less than 5 years comprise 37 percent, 6-10 years--31 percent, 11-15 years--15 percent and more than 15 years--15 percent.

In spite of the apparent economic inexpediency, automobile owners do not worry about expenses and restore motor vehicles that have served out their expected amount of time since it is a shame to turn them into scrap metal, and it takes large one-time expenditures to acquire a new one, even if they manage to sell the old one.

According to data from the aforementioned investigation, approximately one-fourth of the private automobile owners have operated their vehicles in a state of disrepair because of the impossibility of acquiring spare parts or obtaining the necessary technical assistance throughout the entire year or for a shorter period of time, and 1.5 percent of the owners have not used them at all. The sale of spare parts and automotive services to the population has always lagged behind the growth of the fleet of automobiles. Thus, according to our calculations, during 1980-1982 (during this period the prices for spare parts and services remained unchanged) the fleet of passenger cars increased by 22 percent and the cost of automotive service per vehicle in the fleet--by only 13.9 percent, and the volume of production of spare parts decreased by 9 percent. In 1982 the level of satisfaction of demand with respect to the sale of automotive services amounted to little more than 30 percent, and spare parts--35-40 percent of the normative level.

Announcements from various regions of the country concerning unsatisfactory organization of automotive service are printed regularly in the press. An example of such announcements is the letter from the general director of the

Tashavtotekhnobsluzhivaniye Association, V. Fomin: "In the overall volume of services the proportion of repair and services for Zhiguli automobiles of various models amounted to 60-65 percent here. But the supplies of spare parts that are delivered decrease from year to year: in 1981 we received a total of 4.8 million rubles' worth of sets of equipment, components and spare parts, in 1982--4.3 million rubles, and this year only 2.9 million rubles' worth will be delivered. Yet the first automobiles to be produced are getting old. They are requiring more and more parts to replace those that are worn out.

"The situation is no better with respect to other makes of cars and kinds of work. Sometimes we do not receive the most necessary things. Last year, for instance, we submitted an order for 125 tons of paint and were allotted 24 tons; instead of 52.7 tons of solvent they sent us 4 tons. We asked for 19 tons of primer and did not receive a single kilogram. The same kind of sad 'arithmetic' is used with Neva brake fluid, antifreeze, motor oil for Zhiguli cars, and so forth. How can one manage efficiently with this kind of 'shortage'?"<sup>2</sup>

In December 1982 the Politburo of the CPSU Central Committee gave instructions to industrial ministries to take concrete measures in 1983-1987 to further develop the network of enterprises for technical servicing of passenger cars belonging to the citizens and to increase capacities for producing spare parts for them.<sup>3</sup> But the ministries, and above all the Ministry of the Automotive Industry--the head organization responsible for satisfying the demand for spare parts for passenger cars and automotive services--is carrying out these measures very timidly. According to the plan the volume of sales of spare parts to the population should approximately double in 1985 as compared to 1980, but this increase, which in itself is fairly significant, will at best make it possible to satisfy the demand by 70-75 percent of the normative level since the fleet of private cars will increase by almost 45 percent during this period. The volume of sales of automotive service, according to the plan, should also double by 1985, but the arrears in the development of production capacities are so great that the satisfaction of the demand will amount to only about 50 percent of the normative levels.

#### What Does an Automobile Cost?

An automobile potentially improves the quality of life. Its owner is more mobile, he can move about more easily, and he has better access to recreation in nature or cultural objects. Family life is also transformed. During the time a passenger spends on public transportation for work or household business the owner of an automobile can complete 2-4 times as many trips. Moreover more and more people are deriving pleasure from "running around" in the car. This is becoming a widespread and, one must say, a very useful hobby, especially among youth. No other durable object has this kind of training effect.

But the prices for automobiles and the goods and services that go with them, which have continued to increase until recently, have complicated the possibility of acquiring, maintaining and operating a passenger car for a considerable number of families.

The calculations we have conducted show that with an average service life of an automobile of 15 years and average annual travel amounting to 10,000 kilometers, 1 kilometer of travel in a private car costs its owner 14.6 kopecks (taking amortization into account). During 1985-1986 new models will come out: ZAZ-1102, VAZ-2108 and AZLK-2141. They have better consumer qualities than the ones that are being produced at the present time. If the prices for them depend on the price level of the models that are being produced now, the cost of a kilometer of travel in a private automobile will come very close to the cost of a kilometer of travel in a taxi.

Questionnaires of owners of private cars conducted by the VNIKS showed that in many families which have automobiles, expenditures on their acquisition, maintenance and operation deform the structure of consumption, frequently to the detriment of the satisfaction of other important needs.

The prices that are in effect for private cars narrow the range of their potential buyers. While previously automobiles were sold on preliminary orders and with immense waiting lines, now it is much easier to buy a new car and it is much more difficult to sell a used one than it was 2-3 years ago. Materials from a selective investigation of the budget network of the USSR Central Statistical Administration (62,000 families) as of 1 April 1984, which was conducted in order to reveal the intentions of families with savings, make it possible to draw the conclusion that the immediate demand for passenger cars, with the current level of resale prices and the structure of commodity supply, is close to being fully satisfied.

What changes have taken place in the nature of the consumption of private automobiles because of the increased expenditures on their acquisition, maintenance and operation? An answer to this question can be provided by an analysis of comparable selective investigations conducted by the VNIKS among owners of private cars in 1978 and 1983. In the first investigation those questioned provided data for 1977, and in the second--for 1982.

According to data from the investigations in 1983, 58 percent of the owners of private automobiles are people who are engaged primarily in mental labor. The majority of them are specialists with higher and secondary education. Laborers comprised 35 percent of those questioned, and nonworking people (pensioners, disabled people, students and so forth)--7 percent. Both in 1977 and in 1982 about one-fourth of those questioned were involved in driving or servicing motor vehicles by the nature of their basic activity, and there were approximately twice as many of these in rural areas as there were in cities.

The average per capita income of families with automobiles increased during this period by 9 percent and amounted to 126 rubles per month. More than 60 percent of those questioned had an income of more than 130 rubles per family member. According to the data from both investigations, the average time period for accumulating the money to purchase an automobile was 8 years for almost 100 percent of the owners. There was a remarkable reorientation of automobile owners with a higher education from the more expensive to the less expensive models. The behavior of this group largely characterizes the long-range tendencies:

<u>Make and Model of Car</u>	<u>Proportion of Owners With Higher Education, %</u>	
	<u>1977</u>	<u>1982</u>
Zaporozhets	40	47
Moskvich 400, 408	37	54
Moskvich 412, 2140	45	41
VAZ 2101, 210.1	48	45
VAZ 2103, 2106	46	41
Total, regardless of model and make	45	44

The increased retail prices and cost of operation have made the more comfortable models less available for this contingent of consumers. They have changed over to purchasing used cars, which also operate on less expensive fuel.

#### Conditions for Consumption and Expenses

The following paradox is typical. An increase in the rates for maintenance services should logically have led to an increase in expenditures by the owners for this item of their expenses. But, according to data from the investigations, this did not happen. The average expenditures for servicing one automobile at automotive service enterprises decreased from 50 rubles in 1977 to 39 rubles in 1982, or by 22 percent. The number of returns to the technical service station (STO) during this time decreased by almost half (from 1.6 times per year in 1977 to 0.9 times in 1982). While in 1977 62 percent of those questioned took advantage of the services of STO's and shops, in 1982 only 48 percent did. Since the planning assignment was fulfilled by the automotive service enterprises in 1982 one must assume that the figures that have been presented reflect the amounts by which the automotive service production capacities lagged behind the rates of growth of the fleet of private automobiles. Each year more and more car owners are changing over to self-service or are turning to the services of private individuals. According to certain estimates, the "private automotive service" now accounts for about 60 percent of the overall volume of automotive service in the country. The monetary circulation in this sphere, according to estimates, amounts to 600-650 million rubles. State statistics do not take this into account anywhere yet. Without touching on the legal aspect of the problem of "private automotive service" here, let us note that under the conditions of the extremely critical shortage of services for repair and maintenance, there is no doubt about its social usefulness. Private individuals perform any kind of work considerably more quickly, better and in certain cases, even less expensively than it is performed at enterprises.

A comparison of the data from investigations conducted by the VNIKS in 1980, 1981 and 1982 shows: expenditures by the population for spare parts acquired from private individuals are increasing. While in 1980 the proportion of these expenditures amounted to 23 percent, in 1981 it had increased to 30 percent, and in 1982 it has already reached 49 percent. One of the reasons for this is the surprising capability of the spare parts that are in greatest shortage to mysteriously disappear from the warehouses of stores and service stations and end up in the hands of speculators. The number of legal



violations has increased as has the amount of moral and material harm they cause to the society.<sup>4</sup>

Thefts of means of automotive transportation have become more frequent recently and much of the time this is in order to break them down into spare parts. A number of large intrigues have been discovered at technical service stations.<sup>5</sup>

"As specialists have calculated, owners of private automobiles annually purchase only 50-60 percent of the gasoline allotted to them at gas stations. They acquire a considerable proportion of their fuel on the side, primarily from those drivers of state transportation who 'save' on fuel by cheating on their reports of ton-kilometers."<sup>6</sup> Reports about this appear fairly frequently in the periodical press. Some headlines are even fairly eloquent: "There Was No Problem--I Purchased an Automobile" (PRAVDA, 26 September 1983), "How I Sold an Automobile" (SOVETSKAYA ROSSIYA, 15 October 1983), "I Pour It Where I Want To" (PRAVDA, 10 November 1983), "Zigzags in Automotive Service" (NEDELYA, No 3, 1984, p 6), and "Automotive Passions on the Moon" (LITERATURNAYA GAZETA, 8 May 1984).

But in spite of the large amount of attention the press pays to the abnormal socioeconomic conditions for the consumption of private automobiles, the problem remains as crucial as before.

Thus in 1982 more than 160 kinds of spare parts were considered to be in short supply. Approximately half of the automobile owners who were questioned, at the cost of great expenditures of efforts, nerves and time, had still managed to acquire them in stores or at service stations without extra payment, to purchase or exchange them with private individuals, to manufacture them in a makeshift way, to adapt a spare part from another model to fit their own car, or to purchase an entire unit instead of an individual part. The rest of them were forced to purchase spare parts from private individuals at speculation prices which exceeds state prices severalfold. The scale of this phenomenon is illustrated by the figures from an investigation conducted by the VNIIS.

Thus the car owners questioned in 1982 had acquired from private individuals 96 cam shafts for VAZ automobiles worth a total of 17,385 rubles, that is, an average of 181 rubles for one cam shaft. The retail price for the cam shaft is 23 rubles, and 96 of them would cost 2,208 rubles. For the 96 cam shafts they paid the speculators an overall amount of 15,177 rubles. In the selected group of the 96 people who were questioned who had purchased cam shafts for VAZ automobiles from speculators, approximately 12 percent were owners of Zhigulis who had ended up in the selection.<sup>7</sup> In 1982 about 5 million people had Zhigulis. Thus if one were to extend the results of the questionnaire to the general totality, it would be easy to calculate the "net profit" of the speculators.

Recently it has become a widespread practice in service stations to sell spare parts that are in short supply and services in a set with "imaginary services." In order to improve the indicators of the fulfillment of the plan, spare parts that are in short supply are sold only under the condition that the purchaser also pays for imaginary repair and installation work--in fact

this work is not done. During the repair the client is forced to pay for costly technical servicing and other unnecessary operations which are also not carried out.

#### Automotive Service: Decisive Measures Are Needed

The shortage of services for technical maintenance and repair of auto vehicles, like the shortage of spare parts for them, in our opinion, can be eliminated only through expanding and improving all kinds of service in firms. It is necessary to eliminate the departmental separation and consistently follow the basic principle of organization of automotive service which has justified itself in world practice: "I produce, I sell, I service."

Now about 65 percent of the production capacities for automotive service are concentrated in the system of the Ministry of Automotive Industry. They perform approximately 70 percent of the services rendered to the population by state enterprises, and each year they sell up to 45 percent of the market supply of new automobiles and more than 80 percent of the spare parts and accessories.

In addition to the Ministry of the Automotive Industry, automotive service is also provided by the RSFSR, Ministry of the Automotive Industry, the consumer service ministries of the Uzbek, Lithuanian and Estonian Union Republics, Mosgorispolkom, and the All-Russian Volunteer Society of Automobile and Motorcycle Lovers. Strange as it may be, the planning of the main indicators of the development of automotive services--volumes of services, capital investments, limits on labor--are handled by various divisions in the USSR Gosplan. The departmental separation and the lack of centralized planning constitute a serious impediment to conducting a unified technical and economic policy in questions of developing automotive service. They reduce the effectiveness of the utilization of material, financial and labor resources, they do not contribute to improving the quality of services and they make the struggle against abuses more difficult. As a result of departmental separation certain large and densely populated regions have almost no automotive service enterprises. At the same time a number of population points have several of these enterprises which belong to various departments.

The policy of determining the needs for spare parts and their distribution which is in effect in the automotive service system deserves serious criticism. Both of these processes are handled by the plants that manufacture automobiles. They are the ones that determine the list of spare parts that are allotted to each purchaser and the quantity and time periods for delivery. Orders from the recipients are purely formal in nature and, as a rule, are rarely satisfied. As a result, while there is a shortage of many spare parts, large above-normative supplies of parts, components and sets of equipment that nobody has ordered are formed in the local areas.

In our opinion, it is necessary to concentrate all automotive service enterprises under the jurisdiction of the Ministry of the Automotive Industry since questions related not only to production, but also the sales of passenger cars to the population and their pre-sale preparation, technical servicing, warranty and maintenance repair and commission trade can be

successfully resolved only by the department that produces the motor vehicles. "Only such a system makes it possible to have a feedback mechanism between the client and the plants, which receives and studies the most complete information about the quality of the automobiles, takes measures to improve the design, technology and production control, improves the repair capacities and reduces operational expenditures."

To sum up one can say that the development of the domestic market for automobiles is taking place under unfavorable economic conditions and it does not meet the social demands. Recently the problem of selling passenger cars of certain makes and models (Zaperozhets, Moskvich, IZh, Niva, VAZ-21063) has arisen and become more and more acute. Analysis gives cause to suppose that the difficulties in sales will increase. Industry is attracted by the output of expensive, but essentially homogeneous models while the market requires inexpensive automobiles of an especially small class which are economical to operate. Such automobiles will find the largest market if the price does not exceed 2,500-3,000 rubles. It is also necessary to have inexpensive high-powered "rural cars" which are suitable for operation where there are no roads and minitrucks.

Measures which make it possible to balance the consumer demand and the supply and to satisfy the needs of the consumers, including these relatively low expenditures, are already being undertaken. Since 10 January 1985, in keeping with the decision of the USSR Council of Ministers, retail prices have been reduced for the Zaperozhets--by an average of 26 percent and the Niva--by 12.5 percent.

Thus it seems timely:

because of the proposed output of new models of passenger cars, to revise the ratio between retail prices for delivered models and their modifications, taking into account the prices which can be established for the new models;

to reduce retail prices for benzene to the level that existed before 15 September 1981, taking into account the relatively small proportion of the fleet of private cars in the overall consumption, and also the moral and material damage caused to the society by the theft of gasoline from the state;

to develop and assimilate mass production of certain base models of inexpensive passenger cars which are economical to operate, including for rural areas;

in order to increase the volume of services rendered to the population by automotive service enterprises, to improve their quality and also to determine with better substantiation the demand of the population for spare parts and to distribute them more correctly to transfer all the automotive service enterprises existing in the country to the jurisdiction of the Ministry of the Automotive Industry, at the same time granting it the right of a shareholder for the market supplies of passenger cars, spare parts and all commodities of an automotive profile;

to transfer to the Ministry of the Automotive Industry all functions for selling both new and used automobiles, spare parts for them and also the automotive accessories.

#### I Would Buy an Automobile....

There are more than 10 million car owners in our country and each year there are more and more automobiles. But here is the question that arises. The passenger car costs from 7,000 to 15,000 rubles, except for the Zaporozhets for which the prices were reduced recently. Apparently the prices for the promising new models which are being assimilated by industry will not be any lower. But who is going to buy them? Take, for example, my friends and co-workers--engineering and technical personnel, scientific workers and teachers. How many years will it take them to save the money for such a purchase? Understandably there are workers with higher incomes--leading production workers, eminent scientists, important managers and so forth. But it seems to me that it would be incorrect to orient the output of motor vehicles to them. Moreover this could cause negative social consequences: the desire of a certain part of the citizens to live on income which they have not earned, and so forth.

It seems to me that, in the first place, it is necessary for scholars--sociologists, psychologists and economists--to comprehensively study this problem and give their recommendations and, in the second place, why not create not only inexpensive, but also simple models which are accessible to everyone? The modern level of technical equipment and technology will make it possible to make them reliable to operate and convenient to repair, so that everyone who can use the simplest tools will be able to repair them. The mass output of such vehicles, it seems to me, would break the illusion fostered by certain automobile owners, especially those who are sitting at the wheel of "super" models that they are in some way superior to pedestrians who are dragging somewhere along the side of the road with their heavy sacks....

From a letter from V. M. Sokolinskiy,  
Candidate of Economic Sciences, Moscow

#### FOOTNOTES

1. See the article by the minister of the automotive industry, V. N. Polyakov, TRUD, 24 July 1984.
2. PRAVDA, 17 November 1982.
3. See PRAVDA, 12 November 1983; 23 January 1984.
4. See PRAVDA, 12 November 1983; 23 January 1984.
5. See the article by the deputy minister of foreign affairs of the USSR, B. Shumilin, IZ SOLEM, No 6, 1982, p 2. See also IZ SOLEM, No 12, 1983, p 19.



6. See the article by the chairman of the USSR State Committee for Petroleum Products, T. Khuramshin, SOVETSKAYA ROSSIYA, 7 October 1983.
7. The distribution of motor vehicles according to the makes was one of the indicators of the evaluation of the representativeness of the selected
8. Smelyakov, N., "The Development of Domestic Export Capabilities," KOMMUNIST, No 14, 1984, p 47.

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## PROGRESS IN AUTOMOTIVE INDUSTRY NOTED

Novosibirsk EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA (EKO) in Russian No 5, May 85 pp 117-136

[Article by Tat'yana Boldyreva: "Where Has the Zhiguli Taken Us?"

[Text] The growth rates of domestic passenger car construction have increased sharply since the beginning of mass production of motor vehicles at the Volga automotive plant. Zhigulis of various colors can be found on practically any road. There are now 5.5 million of them--this is half of all the passenger cars in private use in the country. It was seen that the comfort and high operational qualities of the Zhiguli, their reliability and the minimal labor-intensiveness of service should bring their owners much greater joy and convenience than is enjoyed by owners of the Moskvich, Volga, Zaporozhets and other motor vehicles.

Let us recall what the managers of the Volga automotive plant said about this on the pages of our magazine 8 years ago:

"The car owner should not experience any difficulties related to repair, adjustment or storage of the automobile. He should only drive the machine, understand whether it is operating correctly or not and fill in the dates of the regular inspections. In countries that have better-developed automotive traditions than ours the convenience of service is one of the important factors in the demand for a vehicle. The buyer is interested not only in the capacity of the engine, the expenditure of fuel and so forth, but also in how developed the service network of the firm which sells the car is.

"We think that the dispatch, transportation, presale preparation and sale, warranty service and service after the warranty has expired, as well as restorative repair--all this is a continuation of the technology of the production of the car in the sphere of consumption. Therefore there are no 'issues which are not ours,' we intervene actively and try to influence everything. AvtoVAZtekhobsluzhivaniye performs those functions of VAZ in which the consumers are interested. It is a part of the association with rights equal to those of any other technological subdivision."<sup>1</sup>

This is not a new idea, but it is extremely attractive to the consumers who, even though they have become accustomed to all kinds of difficulties in

service, still desire to have fewer of them. The breakdown of a washing machine or refrigerator does not cause as much disturbance in a family as an automobile which cannot be driven, especially in the summer.

The network of service offered by the firm following the example of the VAZ has turned out to be the high road along which all similar productions could move without being drowned in a flood of complaints. It was assumed that the plants which produce the Mosvich and Zaporozhets would take this path, and then other enterprises would as well. It would seem that there is no need to recall the many serious decisions that were made regarding this.

But let us take a look at what has actually happened.

#### What Can Be Seen Through the Front Window?

Dear editors, recently I very attentively read (for the nth time) Issue No 1 for 1976. Special attention was drawn to the responses from managers of VAZ.

"The time has come to look back and compare the Zhiguli service before 1976 and at the present time. And the first thing which catches one's eye are the endless lines at the service stations. Many components and parts are not available. An experienced person who listens to the 'voice' of the next automobile passing by can see clearly that it is malfunctioning. And there are many of these vehicles.

"Now one can look for any part in the bazaars. The prices there are as follows: a cam shaft costs 200-250 rubles, piston rings--40 rubles, pistons--100 rubles, oil seals--20 rubles, and batteries--up to 180 rubles. As compared to the real prices these are the same things as flowers in the winter at the North Pole or in the south during the summer. This means that you have written about one thing but in fact something else has turned up."

This is an excerpt from the letter from our reader in Severo-Donetsk. Another car lover from the same place sent a letter to EKO. In order to turn his VAZ engine in for repair he traveled through six cities (Kharkov, Donetsk, Voroshilovgrad and three other large cities under the jurisdiction of the oblast). And none of them would take the engine for repair. We must admit that it is far from pleasant to quote such letters for each ends the same way--"Help!"

In order to see what is taking place with automotive service during the past 6 years let us begin by dropping into the newest and largest VAZ Special Automotive Center in Siberia. It was put into operation on the outskirts of Novosibirsk at the beginning of 1983.

On the outside the new center is similar to a medium-sized plant. It is intended for servicing 13,000 motor vehicles or 50,000 trips to the shop. When one looks at the long glass "headlights" of the broad roof of the production building one automatically thinks that under this roof any one of the 50,000 Novosibirsk Zhiguli owners should feel considerably better. We were somewhat bothered by a conversation in the line in front of the gates beyond which a mandatory operation begins--washing the cars. It is shown

effectively in the movie. But in the line in which the car owners are waiting it became clear not only that they stand there for hours, but that many of them are, as it were, "in transit." One of them with a "broken wheel" had just come from Irkutsk. He had been standing there (or moving toward the gates) for 3 hours, and thanks to the good weather, his family was waiting in a nearby little forest....

"I started working at the old station and I can compare what happened then and what is happening now," says A. M. Rovko, acting director of the automotive center at the time of our visit. "The new center is intended for 1.5 million rubles' worth of services. What are our main problems? The first one is spare parts. Parts for engines are now in the shortest supply. In 1952 our center received only 24 sets of piston rings. No less "famous" among Zhiguli owners are cam shafts. We received 850 of them, as in 1953. Is that a lot or not? The need for the spare parts that are in the shortest supply is being satisfied by approximately 30 percent. It would not be easy to answer the question of how many of various kinds of spare parts are needed. Statistics regarding refusals are not kept, although this would help in obtaining a clearer idea of the needs for spare parts, and the main thing it would be possible with figures to determine which spare parts must be produced and in which quantities.

"But then take a look at what we have lying around in the warehouse, and for more than a year! Here are 600,000 rubles' worth of windshields. Five years ago we purchased them second-hand and we do not know where to put them all. We have enough bumpers to last us about 300 years. And today they will probably start to crawl out from underneath the floor somewhere. Yet we do not have enough of certain spare parts even for warranty repair. We receive what we need after a long strain on our nerves, letters, telegrams and memos. Now we have 106 unanswered claims for replacement. And they must be covered in 12 days. But here is the list from last year when 60 claims were not covered. We are sending the claim documents to VAZ, and we will finally be able to cover some of them."

#### The Principle--"Do It Yourself"

The second problem in the Novosibirsk Special Automotive Center is considered to be internal, but the specialists know that this state of affairs has arisen in other centers of AvtoVAZtekhnobsluzhivaniye as well. Many centers are not operating at full capacity and do not offer all the services for which they are intended, even though they were constructed a long time ago. A shop chief of the Novosibirsk Automotive Center, V. R. Unt, when showing us the work stations, spoke more about the shortage of many kinds of equipment than about the utilization of the available equipment. Unfortunately, domestic industry either does not produce it at all or does not produce enough of it.

The shop chief first counted on his fingers the kinds of equipment which it would be desirable to install and then began to point with his finger to those operations (and very difficult ones) which are performed by hand. One cannot say that in the newest service center of VAZ people work with their bare hands, but with the tools and the means of minor mechanization there is only one decision--"do it yourself."



And one more impression from visiting the Novosibirsk Automotive Service Center: VAZ is the "only light in the window," and the relation to the head enterprise of the specialized automotive centers which are constituent structural subdivisions of it are too "familial" or something. For instance, the Rosavtotekhnobsluzhivaniye system, which was created in the RSFSR Ministry of Automotive Transportation, concludes agreements for the delivery of spare parts. If they are not fulfilled there is an entire set of economic and administrative methods to influence them. When looking at Novosibirsk it seems that the service enterprises of VAZ can only beg and scrape.

And Zhigulis of various colors, shining after being washed, come into the Novosibirsk center. And the faces of their owners are also shining: "I have finally made it under the roof!" But at the gates there is still this same quiet line of cars and faces which are not shining.

We approached one of those who were waiting.

"I registered a month ago for technical service (TO-2), for the warranty," he said, without leaving his car and looking at the gates which were still closed. "I have been moving slowly forward in this line for 5 hours now. My guess is that they do not have enough people, just as at all enterprises."

"They have enough, and they are even selective in hiring people to work here."

"Perhaps they do not select the right ones?"

"If they were not the right ones you would not have been waiting here so long!"

...During the time that has passed since our first visit to the Novosibirsk Special Automotive Center a great deal has changed for the better. The new director, who before that had been the head mechanic of one of the largest plants in the city, took the matter in hand. He put the old equipment in working order and purchased new equipment. There were also changes in the organization of the service. The Novosibirsk workers were among the first in Siberia to organize the rebuilding of engines by the pooling method of repair. You turn in your nonworking engine and receive one that can be operated, and in the meantime yours is repaired and given to another client. The "circulating capital" of engines and spare parts is received from Tolyatti. The plan for 1985 is 400 engines. Everything is all right except for the fact that there are more people who wish to have their engines repaired than the center can handle. In general the center is capable of repairing 100 engines a month by this method, but it does not have enough spare parts.

By and large the changes for the better are appreciable. Perhaps it is not worth mentioning what had been the case at one time? It was worthwhile for at least two reasons. First is that the difficulties in the operation of the Novosibirsk Center are not unique, and all of the VAZ special automotive centers experience them in one form or another. And they have still not completely left the Novosibirsk centers. And the second thing: these endless foul-ups placed the managers of the centers in a position of perpetual

beggars. A good deal is being written in the central press about dishonesty, abuses and intrigues in the automotive centers. And the nutritive environment for these is that very principle of "do it yourself" which here frequently gives rise to another principle: "You scratch my back and I'll scratch yours."

#### What Has Been Done?

What do the specialists from Tolyatti say about the shortcomings in automotive service and the shortage of spare parts? How does the system where by the firm provides service look now as compared to 1976 when the issue of EKO devoted to the VAZ was being prepared?

We were given these figures in Tolyatti. In 1976 there were 9,500 people working in the VAZ automotive service system and now there are 40,000. The plan for the sales of services has increased eightfold during this period: from 20 million to 158 million rubles in 1984. In 1975 service was provided for 1.4 million trips to the shop, and during 1983--4.2 million. And there are now 3 times as many AvtoVAZtekhobsluzhivaniye enterprises (153 and 552).

Specialized sections are being created for restoring parts, components and sets of equipment for VAZ automobiles on an industrial basis. They have organized the production of spare parts that are in increased demand by plants of other departments as consumer goods.

VAZ automotive service has become one of the leading systems for technical service and repair of passenger automobiles in the country in terms of its rates of development and organization. One must take into account that firm-provided service is generally something new for our country.

#### In the Circle of Causes

But if one were to proceed from the principles themselves for organizing the firm-provided service system, the achievements should be determined by the degree of satisfaction of Zhiguli owners. Judging from their letters, conversations with them, materials from the press and impressions of associates and our correspondents in other cities, the difficulties in automotive service are increasing instead of decreasing. What has brought this about?

Managers of the AvtoVAZtekhobsluzhivaniye VPO given two main causes: the inadequate automotive service capacities and the shortage of spare parts. And these problems are interconnected. Automotive service at VAZ is developing at relatively rapid rates, but the production of motor vehicles is increasing even more rapidly. The lag in service is increasing.

It has been established that one repair post is required for every 250 motor vehicles that are produced. According to the norm the motor vehicles produced by VAZ should be serviced by no less than 22,000 posts. And there are only 18,000 of them in the country for all makes of automobiles. Each day 1,800 VAZ automobiles are sold on the domestic market. During this same period the firm introduces only one service post and another one is introduced by other

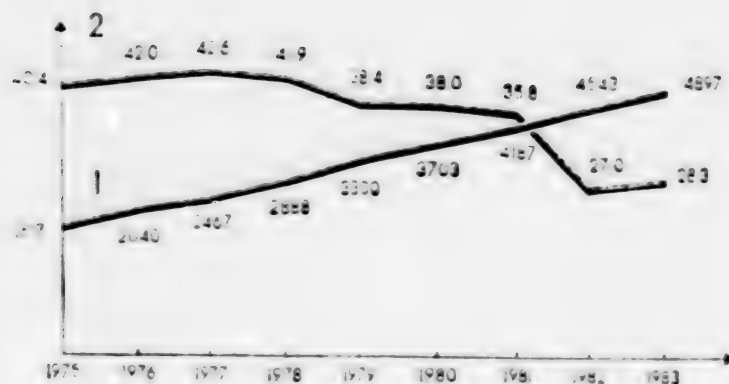
associations (Rostavtotekhhobsluzhivaniye, Mosavtotekhhobsluzhivaniye and so forth). The result is two posts for every 1,800 Zhigulis that roll out of the gates of VAZ. Two instead of seven! And if one also takes into account that four posts are needed for every 1,000 Moskvich, Zaporozhets, Volga and LVAZ automobiles, the total turns out to be two instead of 11!

It is clear to everyone what this arithmetic means: automotive service is chronically lagging behind the needs. Moreover each day this lag increases, and becomes more appreciable and painful for car owners. Here is the root of the evil! The shortage of service is caused by slow expansion and the orientation of planning the development of automotive service not so much in terms of the needs as in terms of the possibilities. In order to rectify the situation it is necessary first of all to think about the scope and rates of development of automotive service and about bringing its capacities up to scientifically substantiated norms.

The Volga automotive plant does not allot capital investments for the construction of specialized automotive centers and stations for technical servicing. Completely different organizations engage in this. Moreover the construction of many automotive centers has been drawn out for many years and the funds that have been allotted are being assimilated by only half. Such is the situation in Khabarovsk, in Shchekino in Tula Oblast, in Magnitogorsk and in Kirovograd. This sad list could be continued. Thus under the 10th Five-Year Plan about 100 million rubles were not provided for the construction of automotive centers and technical service stations, which impeded the introduction of capacities at 2,350 repair posts. And this is only for the VAZ. These figures were given to us in the AvtoVAZtekhobsluzhivaniye VPO.

The situation is also exacerbated by the irregular territorial distribution of the automotive service enterprises. Thus the eastern and northern regions have one-tenth of the motor vehicles and approximately the same proportion of the VAZ service enterprises, but, after all, there are immense areas there, many without roads. And it turns out that not every car owner can take advantage of automotive services under these conditions. Under the 10th Five-Year Plan large stations were created in Siberia, but the development of service networks should take place at more rapid rates. In these regions it is intended to construct new enterprises, and when they are introduced the automotive service capacities will increase 2.7-fold. Unfortunately, the local agencies do not always devote attention to the construction of automotive service enterprises either. In Vladivostok, for example, they are asking for as many vehicles as possible but they are not constructing a service center for them.

In order to accelerate the rates of development of the capacities of automotive service enterprises, specialists from Tolyatti think, it will be necessary to permit the Ministry of the Automotive Industry and other departments, in addition to existing methods, to carry out construction, expansion and reconstruction of technical service stations mainly through the utilization of profit which they obtain from trade in automobiles.



Key:

1. Fleet of VAZ automobiles in the country, thousands
2. Spare parts per 1 automobile, rubles, in wholesale prices

At the same time, the example of the Novosibirsk Specialized Automotive Center shows that the introduction of new capacities for automotive service in and of itself does not solve all problems. A multitude of shortcomings impedes the work and reduces labor productivity in automotive service. There are not enough tools and those which are available do not meet the modern requirements. The level of manual labor is high. Many problems of technical supply for production have not been solved at enterprises of AvtoVAZtekhobsluzhivaniye.

#### Spare Parts--Above All

The shortage of spare parts began to make itself felt in 1977-1988 and it became especially acute by 1979. The management of AvtoVAZtekhobsluzhivaniye gives these figures: now the level of provision of spare parts which are in short supply (there are approximately 100-150 kinds of them) is from 30 to 50 percent, and for some it is even lower. The annual growth of the fleet of motor vehicles requires also an increase in the production of spare parts by 10-15 percent. And instead of an increase one can observe a reduction of the output per unit of the motor vehicle fleet.

Take, for example, the cam shaft or, as the journalists call it, "that enigmatic cam shaft".... So much about them has already been written and written again! We shall not talk about quality for the time being. This is a special problem and we shall return to it. But here are the figures: from 1978 through 1983 deliveries decreased almost by half. Yet the fleet of motor vehicles increased a great deal. The proportional reduction of the delivery of cam shafts (per one automobile) is two-thirds. In 1984 the supplies amounted to 281,000 units, that is, they remained almost at the 1982 level. Certain spare parts are produced in such quantities that even the need for them for warranty repair is not being satisfied.

At VAZ they think that one of the main reasons for this situation is mistakes in predictions. It was thought that the motor vehicle should serve 8-10 years and certain specialists that it would even serve for less time than that.



After that amount of time the motor vehicles were to have been written off and replaced with new ones. But so far practically not a single one has been written off. On the whole one-sixth of the VAZ motor vehicles have already put in their time, and spare parts are not envisioned for them at all. Yet these motor vehicles are being repaired and many more spare parts are required for them (in terms of value and quantity--3 times as many). You cannot say to a car owner: "Throw it in the dump!" These motor vehicles are being repaired to the detriment of the new ones.

Another factor is the inadequate service life of certain parts and components. Improved quality could reduce the shortage, and it would only be necessary to take extra measures on time. But let us note that sometimes the manufacturing plants are not at fault here. For example, they think in the division for analyzing defects at the AvtoVAZtekhnobsluzhivaniye that the poor quality of oil causes premature breakdown of engine parts (they only last half as long!). Moreover, they do not produce enough even of these oils and the motor vehicles are frequently operated on used oil. Let us note: in foreign practice of operating VAZ motor vehicles there are no precedents for premature breakdown of cam shafts for this reason.

But why were these special measures for improving quality not taken promptly? After all, one of the declared pluses of the system whereby the firm provides services is feedback. The manufacturing plant should receive "defect announcements" from the specialized centers each month--notifications of shortcomings discovered in the motor vehicles.

Additionally, there is a system of emergency communications. By telephone or telegraph information is sent to VAZ concerning new, atypical defects. For example, in 1982 dozens of reports came in concerning breakdowns of the connecting pipes of the main brake cylinder. Having received the information, VAZ specialists immediately set out for Syzran where they are produced. Immediate measures were taken to observe the technology for the manufacture of this part and the problem was solved. As we can see, there are examples in which the manufacturing plant reacts to information that comes in from the technical service system. But this happens far from all of the time.

On the VAZ Clock--1987

How is the plant solving the problem of satisfying the needs of car owners? The main area which helps to improve the state of affairs at VAZ is considered to be the restoration of worn-out parts, components and sets of equipment. All industrially developed countries are now following this path. There they restore more than half of the parts of certain kinds. This path is also advantageous for the automobile owners--for restored parts cost the owner 40 percent of the value of the new ones and at the same time they last 80 percent as long.

In order to implement the aforementioned decision the Politburo of the CPSU Central Committee is continuing to organize restorative repair at automotive centers and stations of VAZ. Special flow lines have been created for restoring millions of brake shoes, 1.6 million valve drive levers, 120,000 cam shafts, 200,000 steering rod tips, and so forth. In 1984 15 million rubles'

worth of equipment was restored, and by 1990 this will reach 35 million rubles in retail prices.

There are also difficulties involved in restoration. In order to restore the worn-out items one must first acquire them, and this is not simple. The car owners do not wish to part with their "trash" and will keep it in their garages instead. And this can be understood: what if they suddenly need it? Moreover, there are components and parts which cannot be restored at all. At VAZ they think that the situation with respect to spare parts will be rectified only when the plants for restoration work reach their planned capacities. Moreover, it is necessary to begin immediately to construct new plants, and this is a task not only for VAZ, but also for the Gosplan and the construction ministries. Areas have already been allotted for the plants, plans have been developed, and...everything has come to a halt. There is no money, there is no contract, the contractor will not accept the volumes, everything is going around in a circle.

Along with taking measures for restoration, the VAZ has considerably expanded its capacities for producing spare parts. Today they are produced in an amount of 160 million rubles a year (in 1975 it was 70 million), that is, 10 percent of the production capacities work on spare parts. But the need for them is for approximately 210 million rubles. The difference amounts to 50 million rubles. And here is where the main shortage is--cam shafts, piston rings and so forth!

Many car owners suggest reducing the production of motor vehicles in order to increase the production of spare parts. It is difficult to agree with this. For less than 10 percent of the parts of the motor vehicle are in short supply. Another solution can be seen in having other plants manufacture a considerable proportion of the spare parts. VAZ accomplishes this by distributing its orders for spare parts.

What is industry's attitude toward them? Certain plants have a very conscientious attitude and understand the national economic and social importance of the problem. Thus in 1984 the Saratov Serp i Molot Plant began to produce cam shafts, and the Khmel'nitsy Termoplastavtomat Plant and the Kharkov Serp i Molot Plant are preparing for producing these parts. The Riga Krasnayazvezda, the Volga Type Plant, the Voronezh Aircraft Plant, the Baksan Avtozapchast' and other plants have begun to produce mufflers. Even in 1985-1986 they will produce 650,000-700,000 mufflers. The Kherson and Grodno crankshaft plants will produce 650,000 universal joints (with the prospect for producing 1.2 million in 1985). The Ministry of the Automotive Industry is not standing to the side either: it has earmarked another nine industrial enterprises which are assimilating the production of spare parts.

Many parts, especially very simple ones, can and should be manufactured locally. But there are difficulties here. Thus in Novosibirsk they try to arrange the output of certain parts which are in short supply at large enterprises of the city. In principle there were no objections. But in order to begin manufacturing the plant needed a stable program for many years in advance, and also significant production volumes. Only then would it be advantageous. But who can guarantee this? Nobody is studying the market

conditions. Perhaps after a couple of years there will be no demand for these parts. Moreover, when assimilating nonprofile parts the production outlays increase, especially at the beginning. Perhaps we should proceed more boldly along this path and raise the prices for spare parts? After all, on the market they are 10 times higher than even these increased prices would be....

It is gratifying that the production of spare parts will be increased and that during 1985-1986 VAZ intends to eliminate a number of kinds of them, but this process must be controlled under a planned policy, for herein lies the real causes for the problems in automotive service! It is necessary to have an in-depth analysis of the firm-provided service system which takes into account all of the positive and negative aspects of its 13 years of practice. Only on the basis of an analysis will conclusions and suggestions be made concerning the correctness and effectiveness of this system. It would seem that a frontal attack, an approach to solving the problems solely in terms of external factors and negative phenomena would not be suitable here. These factors do not lie on the surface and they have not just come into being.

The VAZ firm-provided service system has its own state plan which is annually increased by 17-20 percent. This plan is regularly fulfilled, as are all other technical and economic indicators (profit, commodity turnover, introduction of capacities from capital construction, and so forth). But the demand for service is twice as great as what is envisioned in the plan. Where should automotive service look for possibilities of satisfying this demand?

At the dawn of scientific progress Archimedes stated: "Give me a place to put the fulcrum and...." Who will provide such a point for automotive service? Apparently the technical service system needs not general discussions of the shortcomings in its work, but radical measures on the part of authorized agencies which would eliminate the disparity between production and consumption.

#### Recollections of the Future

Frequently an automobile, for which the consumer has given a goodly share of his savings from work, becomes dead metal within 5-6 years and sometimes even sooner. Certain owners, especially in rural areas, purchase a second vehicle without any hope of breathing life into the first one. There are no spare parts, tires or batteries. Incidentally, all of these are available. But only on the black market. Continuously and without any shortage as the car owners tell us.

The chief of the Tolyatti city division of the BKhSS, A. I. Telegin, says:

"First of all I would advise not to purchase anything second-hand. And not only because this encourages 'swindlers' and speculators. It is difficult to purchase a good-quality part there. We conducted an inspection and it turned out that the cam shafts sold there are substandard. Either they have been made from substandard blanks or they have been forged...by fools. And one also finds another form of 'services.' Of course good parts also end up on the market. Where do they come from? They have been either carried or shipped from VAZ and from its affiliated plants or they have disappeared en

route to VAZ. There are many thefts. And it is amazing how far people will go to carry them out! We have an entire album which documents all the methods of this kind of 'automotive service.' The police are waging a battle, and not without success, but as long as the spare parts cannot be purchased at the technical service stations it will be difficult to significantly reduce the number of thefts."

The VAZ path is now being taken, although fairly slowly (this was discussed as early as 1976), by other associations--KamAZ, AZLK and VAZ. In the press they are discussing the creation of a firm-created service system for Izh-Avto. Before extensively developing networks of the firms it is necessary to think about the VAZ lessons. And there is something to think about here. The question "Why?" is implicit in all of the discussions with managers of the association. And when one receives an answer one wishes to ask this "Why?" and then again ad infinitum.

The first question pertains, of course, to the sources. There are mistakes in predictions. But from the outside it seems that it would not be difficult to foresee them. There is hardly a family who has been saving money for 8 years for the purchase or who has taken out loans who would discard a motor vehicle as soon as they have discharged these debts. And here one can hardly follow blindly the experience of foreign forms.

Moreover, it is not simply a matter of predictions. There were difficulties with automotive servicing even before the period of service of the VAZ machines came to an end. Moreover there has been time to make corrections in the predictions. In 1978-1979, according to the predictions, the owners of the first Zhigulis should have been saying good-bye to their "steel horses." Those very 7-8 years for which the vehicles are intended have passed. And this has not happened. Although....

In his article the general director of the AvtoVAZ Association wrote: "Under the 11th Five-Year Plan VAZ was oriented not toward output in excess of the program (today 10 percent more vehicles come off the conveyor than according to the initial plan), but toward improving quality. Up until 1985 the number of motor vehicles that are produced will not increase (720,000 a years). The increase in production will be oriented toward spare parts with a refinement and an adjustment of the list of them. But the increase in the volume of spare parts cannot be unlimited. We are not able to use all parts for spare parts closing our eyes to the fact that they are sometimes used to put together a new motor vehicle on the basis of an old one...."<sup>2</sup>

More and more motor vehicles were produced although it was already clear that they were not to be provided with spare parts or automotive service capacities and within a couple of years they were doomed to being useless heaps of iron. Incidentally, the output of motor vehicles is the primary and major task of the association, and its successes are judged according to the fulfillment of this task. Moreover VAZ motor vehicles are in demand on both the domestic and the foreign markets, they comprise a considerable part of the country's commodity turnover, and it is very tempting to produce more and more of them.



Thus gradually the slogan of the firm-provided service system--"I produce, I sell, I service"--has been changed to the detriment of the third component. Completely in keeping with the laws of nature, the thunder has not come out of a clear sky! Let us recall the excerpt cited above from the article by the association's general director. The year 1981 was right around the corner at that time. It was then that when the question of automotive service and spare parts was considered by the Politburo of the CPSU Central Committee the association took immediate measures at all levels. They were more like emergency measures. But how soon will VAZ be ready to take on all of the concerns related to service? This uncertainty is creating a lack of confidence in millions of people who are bringing billions of rubles to the coffers of the automotive stores.

The decisive word and resolution actions could issue from the managers of the Ministry of the Automotive Industry under whose jurisdiction about 70 percent of the service capacities are concentrated. But the automotive builders, being concerned about the output of motor vehicles and much less concerned about what happens to them outside the gates of the automotive plants, have still not become "legislators" regarding all problems of motoring. We have tried to understand how the system of the Soyuzavtotekhnobsluzhivaniye VPO is related to the VAZ system. The most intelligible answer was: "They report to us, but they are independent," that is, there is no unity in the management of these problems even in the Ministry of the Automotive Industry. Consequently, there is also no unified policy, no unified approach, no combined efforts and no general direction toward the main goal--satisfaction of the needs of those who acquire the motor vehicles which are produced in the plants of the ministry. It turns out that the department is in some measure working for itself, for its own interests, and not for the consumers of its products who up to this point have only one right--to write complaints. ,

We have become convinced: on the one hand, the lack of orientation of AvtoVAZtekhobsluzhivaniye toward the real needs for services and, on the other, the production of Zhigulis without taking into account the possibilities of servicing all which need it during the warranty period and after it have all produced this large sum of shortcomings. And they have wiped away the bright memories of those days when they set out to sell the idea of "I produce, I sell, I serve" with the conviction that they could create a good service system.

This is especially bad because VAZ the automotive service is not a case in which the functions of the service were imposed upon the enterprise. It proceeded toward this deliberately. They wanted to do it as well as possible...and in the awareness of the consumers there spread a new and very enticing model: all the individual had to do was know how to drive, and the firm would take care of everything else. If you had a breakdown on the road the mobile firm stations would provide service, if the breakdown were serious--they would tow it (incidentally, this is now a problem: how does one deliver a car to the station if it is not working), they would wash it and change the tires. The owner would have no headaches! At that time few automobile owners knew in advance that they would have to service it "by the sweat of their own brow" or thought about this in advance, before purchasing

it. They did not prepare ahead of time. And now the idea promoted in Tolyatti has played a dirty trick on its creators.

But is this orientation toward having the service take on absolutely the entire volume of repair and servicing realistic? Foreign experience shows that more and more automobile owners want to make repairs themselves, especially simple ones, they want to "rummage around" in the automobile. This also satisfies the need for technical creativity, that male desire to learn to do more with his own hands. But one cannot repair with one's hands an automobile that is standing out in the open. It is possible to organize "self-service posts" at garage cooperatives which are equipped with hoists and the necessary equipment. Here it would be expedient to enlist more extensively on a cooperative basis the means of the car owners themselves, which is extensively practiced in a number of socialist and capitalist countries. Republic car owners' societies can render a great deal of assistance in organizing self-service.

This path is apparently promising, especially if one thinks about how many specialists there are who are employed in automotive service, about the increasing flow of machines that will be in need of service within 5-10 years, and about where these services will be acquired when there is a shortage of labor resources.

It would also help the automobile owners to introduce a new kind of standard which we do not have yet, but they are very widespread abroad. This is the "standard of performance," that is, the standard for carrying out service. There can be no "ceiling" on quality, but there must be a "floor." The time has come to transfer the commitments of service workers which are difficult to measure into the area of mandatory standards, the deviation from which would entail certain sanctions.

Clearly this is not a matter of the principles of firm-provided service themselves, which are essentially very attractive. The principle of orientation toward the interests of the consumers has been violated. This problem is typical not only of this branch. For many branches of the national economy the "outlet to the consumer" has been replaced by the departmental and branch approach. Automotive service is being transformed into a mini-subbranch with its own inherent indicators and evaluations. As long as the thunder is not threatening....

An ability which has not yet been developed and the lack of desire to be oriented toward the consumer which is inherent in more than just the VAZ system of services shows that the causes here are deeper than simply mistakes in predictions, shortages of metal and the slow construction of automotive service stations. To begin mass output of vehicles intended for people with a way of life and education which is quite different from that in the West, to select a particular model whose design is intended for it to be regularly (and for many years) serviced in the firm-provided service system and not by the hands of skilled automobile owners, and at the same time to put into operation the entire conveyor of services which are required by the design of this vehicle--this, it would seem, was not only a bold experiment, but also a mistake.

...But still firm-provided automotive service is the most progressive kind of servicing. If one disregards its shortcomings it is essentially convenient for the motor vehicle owners. And this is why we are asking the Ministry of the Automotive Industry and other departments: When will the long-suffering automotive service network be joined together? When will a unified policy be conducted here? When will the capital investments be allotted centrally? When will the production and provision of garage equipment be arranged? When....

Delay in answering these questions threatens not only the motor vehicle, but also millions of people who are associated with it--the owners and the members of their family. It is time!

...Now organizational changes are taking place in the VAZ association. The AvtoVAZzapchasti Association has been made part of it. For better distribution of spare parts throughout the territory of the country 155 support bases have been created and five regional AvtoVAZtekhobsluzhivaniye associations have been formed. One can see certain efforts on the part of VAZ and the desire finally to start things rolling. And we shall hope that there will be results as well.

Table--Makes of Automobiles in Private Use\*

1. GAZ M-20, GAZ-21	3.3	4. ZAZ 965, 966	4.0
2. GAZ-24, 3102	5.9	ZAZ 968, 968M	6.7
3. Moskvich 401, 407	2.3	5. VAZ (except "Niva")	51.8
408, 412, 2136	13.0	6. "Niva, GAZ-99, UAZ-463, etc.	2.6
2140, Izh, 2125	8.6	7. Other makes	1.8

\* Figures for 1 January 1984

#### FOOTNOTES

1. See: EKO, No 3, 1976.

2. ZA RULEM, No 90, 1980.

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## TROUBLES WITH AUTOMOTIVE REPAIR DISCUSSED

Novosibirsk EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA (EKO) in Russian No 5, May 85 pp 137-142

[Article by G. F. Fastovtsev, candidate of technical sciences, Scientific Research Institute of Automotive Transportation (Moscow): "Large, Small...Various"]

[Text] If a refrigerator or watch is broken we take it to the shops of the Ministry of Consumer Services. It is not so simple with automobiles. And although the production capacities of automotive service have increased more than eightfold since the time of their creation and the value of fixed production capital is close to 1 billion rubles, the level of satisfaction in the demand for services is inadmissibly low. What are the reasons for this?

Many of the shortcomings have been brought about by the structure of automotive service, by its many stages and many units. How was this structure formed?

On the threshold of a significant increase in the production and sales of passenger cars to the population the union republics began to create specialized Avtotekhnobsluzhivaniye organizations which operate on cost accounting [khozraschet]. These organizations appeared in 1969. At the same time at plants of the Ministry of the Automotive Industry which produced passenger cars there appeared plant--firm--systems of technical servicing. In 1976 in the Ministry of the Automotive Industry the All-Union Soyuzavtotekhnobsluzhivaniye Industrial Association was created, to which by now the majority of republic organizations have been transferred. But this has not led to the appearance of a unified agency which would have jurisdiction over all systems of automotive service.

The many units, the existence of several systems which are practically independent of one another, and the subordination of organizations for repair and service of automobiles to various agencies impede the planning, prediction of the demand, accounting for the demand for spare parts and equipment, and the formation of a unified technical policy. The time has come for organizational changes in this area.



Even now the system of automotive service is absorbing significant material and labor resources. According to data of Giproavtotransz, the cost of the startup of one working post amounts to amount 50,000 rubles. There are up to 100,000 skilled specialists employed in automotive service and by 1990, with the current labor productivity and organization, the need for them should increase.

By this time the value of fixed production capital should increase correspondingly.

These predictions have a great deal to do with the high labor-intensiveness of servicing domestic automobiles. Although the modern domestic automobiles can compare with foreign analogues in terms of labor expenditures on service and repair, in the country's automotive fleet there are still many vehicles which were produced before 1970 (in the USSR the service life of automobiles with single owners amounts to an average of 15-20 years). The labor-intensiveness of the service of these machines is considerably greater and they require many more spare parts.

Therefore despite the constant updating of the country's automotive fleet and its augmentation with motor vehicles which are technologically improved and better designed, the overall growth requires a significant increase in expenditures in the sphere of automotive service. If one takes into account the fact that production capacities in this sphere are lagging significantly behind the need for technical service and repair "at the start" and the high rates of the introduction and use of automobiles, one can understand those immense efforts and expenditures which are necessary in order to eliminate the ever-expanding "scissors" of supply and demand.

But what is necessary in order to eliminate these "scissors," to achieve more effective utilization of resources?

The proposed measures can be divided into two groups: improvement of the organization and management of production at automotive service enterprises and efficient planning, construction and distribution of the network of automotive service enterprises.

Now problems related to the distribution, concentration and cooperation of the activity of service stations are not being resolved efficiently enough. Preference is given to the construction of new universal stations, including for 50 and even 100 posts because at these it is easier to concentrate technical equipment and other resources. There are clearly not enough small stations, including specialized ones. Yet 85 percent of all the requests are for minor repair which takes no more than 1 day. These jobs comprise only 15 percent of the overall volume of services. And conversely: large repair jobs which comprise 85 percent of the volume of services account for 15 percent of the requests at technical service stations. In socialist and capitalist countries the majority of service stations engage in preventive maintenance and minor repair. Naturally, the car owner would like to have this kind of repair, as they say, right in his own back yard. Therefore a dense network of small automotive repair shops with two-five posts and less frequently up to 10 of them are being created in all rayons of a large city. They are distributed

within the microrayons in such a way that the distance to one of them from any point does not exceed 3-7 kilometers. The remaining 15 percent of the orders which are for large repair jobs can be filled in large shops and automotive centers. This is convenient for owners as well: for we purchase bread and milk right next door; for a rug, for example, one can go to the center of the city to a specialized store; but for an automobile one must go to another city because expenditures on the trip in this case are in line with the cost of the purchase. The same thing can be said about automotive service. Body work costing about 1,000 rubles can be done expediently in a large, well-equipped specialized center, but preventive maintenance and eliminating small dysfunctions should be done immediately and not far from home.

Here is a clear example of the kinds of inconveniences that are created for the car owners by megalomania. If one assumes that one working post services 200-250 motor vehicles a year and the level of the introduction and use of automobiles in the country is an average of about 40-50 automobiles per 1,000 residents, it is not difficult to calculate the territory for which such a giant center is intended. And small stations bring the services closer to the consumers, which is of no small importance for enterprises that serve the population. One of the advantages is personal contact with the client in an atmosphere of confidence. Here it is easier to keep track of the needs of the motorists. So far the development of automotive service in the production of spare parts do not have a clear-cut reference point since the large stations do not have any complete accounting of the need for spare parts. Workers in these stations cannot notify the consumers when the required spare parts will arrive.

Firms abroad which have their own automotive service networks keep card catalogues at these "home" stations, which make it possible with the help of computer equipment to predict the exchange and purchase of new automobiles and, the main thing, the time and nature of the work that will be done at the service station. This provides feedback and the possibility, by reacting quickly to the demand, to determine the direction for further development and the need for spare parts. Such a system of service stations is typical of socialist countries and also of such well-known firms as Renault, Fiat, Volkswagen, and so forth.

Small stations can fill the role of something like "receiving points" for the larger stations. A car owner takes any repair job to a small station near his home. Here they do a "diagnosis." If the repair is minor it is done right there and within a short period of time, but if the malfunction is more serious, the vehicles are formed into batches and, without the participation of the client, are sent to specialized stations where they are repaired and then sent back. Again the client does not have to go anywhere: he receives the vehicle as "his own" station.

Now objections to small stations are reduced to the fact that labor and material resources are dispersed among them and overhead expenditures increase since at each station, even the smallest, there must be a bookkeeper, a dispatcher, a receiver and so forth. Yet this is certainly not necessary. In small shops these jobs can be combined into one. Let us emphasize that combining the jobs is an indispensable condition for effectiveness and

profitability of these stations. As the experience of socialist countries shows, here one can successfully utilize the labor of pensioners. In Hungary, Poland and the GDR it is typical to organize small shops in various forms: both private production of services, mainly using members of the family, and sometimes hired labor force, and individual production of services during free time on the basis of a contract or for hire; family enterprises that operate on a rental or a contract basis in cooperation are widespread. In any case this activity is controlled by the state and is not given out to be bought up by "Uncle Vanya."

Small stations that are provided with modern equipment and are served by highly skilled specialists can be more profitable than large ones. Orientation toward a larger proportion of them in the automotive service system certainly does not mean dispersion of labor and material resources as certain specialists think. But here there is a clear-cut distribution of functions: the proportion of small, large and highly specialized stations corresponds to the structure of the demand for various kinds of work and they cooperate in their activity.

In terms of their structure, technology, planning, production activity and sizes, the service stations should have a certain flexibility in order to respond efficiently to fluctuations in the demand, including seasonal fluctuations, and changes in the concentration of the fleet. The module-sectional principle of planning stations and industrialization of their construction will help to create such a flexible system. Now many service stations remind one of reinforced concrete pillboxes: it is easier to tear them down than to change them by reconstructing them. Yet experience shows the effectiveness of lightweight prefabricated stations which are adapted for the introduction of flexible technological processes. They are constructed from lightweight metal elements and modern finishing materials are used. The installation and assembly of stations made of prepared standardized plant-manufactured elements reduce the time period for construction. For example, in Poland small prefabricated service stations are constructed from the simplest metal elements. They can be rapidly installed in a field, next to a road, and so forth. They can be manufactured at any plant that produces automobiles. Our country also has this kind of experience: it is related to the application of lightweight metal structures.

The standard module supplied with equipment for performing one or several related kinds of work includes premises (production, warehouse, administrative) and also work stations and so forth. Several similar or difficult but technically and functionally related modules are joined together into a planning unit. From these technical unified individual models they form stations of various sizes, capacities and purposes. The automotive service centers can be of two types: when there is sufficient concentration of the fleet--narrowly specialized (for engines, electric equipment and so forth) and also universal ones. The overall approach here is this: the larger the center the higher the labor-intensiveness of the work per one automobile.

The module principle will make it possible, depending on the conditions and the demands, to easily reconstruct stations without halting production, that

is, to make them "growing." Rapid and stage-by-stage introduction of these service stations will make it possible to reduce one-time capital investments, to eliminate the "service famine" in short periods of time and, additionally, to provide for further growth and development of stations as a result of their profit and, possible, through their own efforts.

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## FUTURE OF AUTOMOTIVE DESIGN PREDICTED

Novosibirsk EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA (EKO) in Russian No 5, May 85 pp 142-150

[Article by D. M. Etkin, candidate of economic sciences, Central Scientific Research Automotive and Motoring Institute (Moscow): "What Kinds of Automobiles Does the Population Need?"]

[Text] All of the passenger cars produced in our country today are for four to five people. The structure of their sales, depending on the work volume of the engine and the dry mass (these parameters indirectly determine the comfort of the motor vehicle) is as follows:

especially small class (Zaporozhets and its high-powered variety, Volyn')--17 percent;

small class (all models of Zhiguli and Moskvich produced by the Moscow and Izhevsk plants)--40 percent;

middle class (Volga)--3 percent.

This ratio of sales ensues from the existing structure of domestic production of passenger vehicles. Unfortunately, it has become established without taking into account the potential demands of the domestic market. And because of the critical shortage of motor vehicles up until recently, there has been no evaluation of these demands. No practical experience has been accumulated and no generally acceptable methods have been created for these developments.

The potential demands of the domestic market for passenger vehicles are determined by a whole number of factors of a social, economic and demographic nature. First among them are:

the peculiarities of the utilization of motor vehicles belonging to the population;

the prospects of that part of passenger transportation which can expediently be carried out in private vehicles;

the demographic characteristics on which the desire of groups of the population to acquire precisely this model of motor vehicle depends.

What demands have come to be placed on passenger vehicles today? According to the results of a questionnaire conducted by the VNIIEK, after repeated increases in the retail prices for gasoline in 1981 the significance of fuel economy increased essentially. Now car owners consider it to be the first among the characteristics which need improvement (previously this indicator was in fourth place), after increasing the corrosion resistance of the body, durability and reliability of the motor vehicle. At the same time, the factors which as before determine the preference for one model or another are still reliability and comfort.

Against the background of the overall increase in the provision of passenger cars there is a reduced demand for models which are characterized by a relatively high retail price and high expenditures on operation, but reduced reliability and comfort. This tendency shows that under the existing conditions not just any model of passenger car can have a steady demand on the country's domestic market. Therefore the developments of new automobiles should be preceded by a considerably larger volume of prognosticatory research.

Approximately two-thirds of the fleet of passenger vehicles belong to the urban population and one-third to the rural population. More than half of the city car owners live in cities with a population of more than 500,000, 36 percent--with a population of 100,000-500,000 and 10 percent--in small cities (with a population of less than 100,000) and villages of an urban type.

The average annual duration of the operation of private automobiles belonging to city residents slightly exceeds 9 months a year, and the average annual distance of travel is about 10,000 kilometers. In 1977, before the increase in retail prices for benzene and prices for passenger vehicles, the average annual travel time amounted to 11,600 kilometers and was steadily tending to increase. The annual travel time of motor vehicles also depends on climatic conditions and the sizes of the population points in which the owners live. Thus when there is a cold climate the annual traveling distance of a motor vehicle is approximately 10 percent less, and with a hot climate it is 25 percent more than the average for the country.

The questionnaire showed that during the period of regular operation of vehicles the city dwellers completed an average of eight trips a week, of which 45 percent were to work and on business and 55 percent were trips related to recreation (outside the city and within the city). With the various purposes of trips there were various degrees of filling of the private cars (see Fig. 1). Thus with trips to work and on business most frequently there were one to two people in the automobile, and on trips with purposes of recreation, as a rule, family trips--there were four people.

Let us try to evaluate from the standpoint of the interests of the society the prospects for the utilization of passenger vehicles for trips with various purposes. All passenger transportation will be divided into two main groups--inside the city and outside the city. The former group today accounts for 78

percent of the overall volume of transportation and 35 percent of all passenger turnover, and the second category--28 percent and 65 percent, respectively. During the period since 1965 the number of intraurban trips per one urban resident has almost doubled and the number of trips outside the city has increased 4.3-fold. One can expect that in the future the volume of passenger transportation per one resident will increase mainly as a result of trips related to recreation. This corresponds to the tendency being manifested in the world toward a reduction in the volume of passenger transportation of the proportion of trips to work as the income of the population increases.

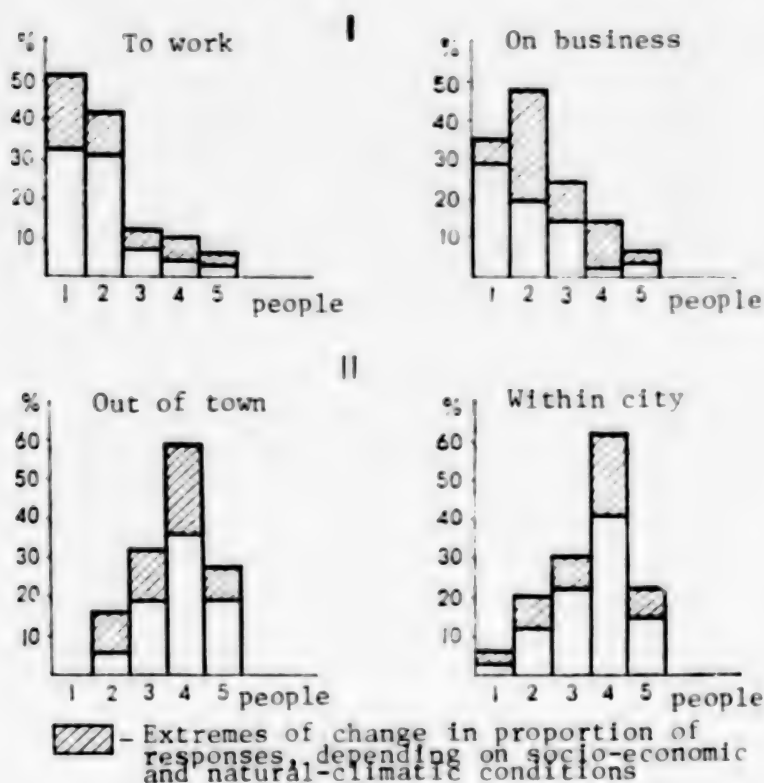


Fig. 1. Loading of Private Passenger Vehicles, Depending on Purpose of Trip (From Responses of Car Owners).

Further, let us single out that part of the passenger transportation which can be most expediently carried out with private passenger vehicles. In order to provide for the constant intra-urban passenger flows (about 2,000 passengers per hour during the "peak" period in one direction) using passenger vehicles it would be necessary to have three lanes of traffic while with buses it would only take one. Providing passenger service outside the city with passenger vehicles and buses requires the same number of lanes of traffic, regardless of how heavy the flow of traffic is. The proportional expenditure of fuel with the same volume of operation with intra-urban transportation in passenger

vehicles is 8 times greater than with buses, and with trips outside the city-- 2.7 times greater. The utilization of passenger vehicles for trips outside the city releases 3.5 times more bus drivers than for intra-urban transportation.

Consequently, from the standpoint of economizing on resources that are in short supply it is much more advantageous to utilize private passenger cars mainly for trips outside the city. These conclusions are indirectly confirmed by the results of the questionnaire of the automobile owners. Almost 56 percent of those questioned gave as the basic reason for purchasing an automobile the possibility of taking trips outside the city on their days off and longer trips during their vacations. Only 10 percent of those questioned consider the main reason to be the possibility of reducing the time it takes to travel to work (Table 1).

Table 1--Distribution of Car Owners to Question on Questionnaire Concerning Basic Reasons for Purchasing an Automobile

<u>Reason for Purchasing Automobile</u>	<u>Proportion of Those Questioned Who Gave This Reason as the Main One</u>
Possibility of taking trips outside city on days off	35.2
Possibility of taking long trips during vacation	20.5
Love of technical equipment and pleasure of driving a car	19.2
Possibility of using the automobile for business needs	12.2
Reduction of time of trips to work	10.3
Prestige considerations	2.6

Let us add that the inadequate development of the network of main highways, the shortage of temporary parking places near trade, cultural and administrative centers, and also the improvement of the work of public transportation in cities reduce the sphere of utilization of passenger cars inside the cities. At the same time it is obvious that motor vehicles will be used more extensively for trips outside the cities as a result of the opportunities granted by the Food Program to urban residents to plant garden plots and develop private subsidiary farms in rural areas.

Thus the area of application of private passenger cars for city dwellers is mainly trips outside the city for purposes of recreation. As a rule, they involve the entire family. This conclusion corresponds to the practice of the utilization of private passenger cars in the CEMA countries, particularly the GDR and Czechoslovakia where they have achieved a higher level of provision of automobiles for the population.

Which automobiles correspond to these purposes to the greatest degree? In order to answer this question let us analyze the structure of the family (Table 2).



Table 2--Structure of Families in USSR, % of Total for Country\*

<u>Indicators</u>	Including Families Consisting of a Number of People Living Together								<u>10 People and More</u>
	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>6</u>	<u>7</u>	<u>8</u>	<u>9</u>	
Total families in USSR, %	29.7	28.9	23.0	9.5	4.1	2.0	1.2	0.7	0.9
Including									
Urban population	29.1	32.2	24.8	8.5	3.0	1.1	0.6	0.3	0.4
Rural population	30.5	23.0	19.6	11.3	6.2	3.6	2.3	1.5	2.0

\* Source: VESTNIK STATISTIKI, No 12, 1980

According to the data from the last census, there are more than 66 million families in the USSR: the average size is 3.5 people (in the city--3.3 and in the country--3.8). Additionally, about 15 million people are single. This means that most of the passenger cars sold to people living in the city are models that are intended for four to five people. But, as one can see from the same statistics, this does not preclude the need for a microcar, including according to the formula "2 + 2" (two full-size seats in front for adults and two rear seats for children). This kind of automobile, which has a smaller passenger area inside, can be smaller in dimensions and weight, and also can use less fuel with the same reliability, safety, rough road performance and comfort of the location of the front seats as in the models with four-five seats.

A preliminary analysis has shown that as compared to the new front-wheel drive models of passenger cars, which the main plants of the branch are beginning to assimilate for mass production, the material-intensiveness of the small cars can be reduced by 12-15 percent and the expenditure of fuel--up to 10 percent. The potential buyers of these cars are single people, families consisting of two people, and also families of three or four which include small children.

The need for the production and sale of small cars on the domestic market is confirmed by a comparison of the age structure of the entire population and that of car owners. Thus the proportion of the age group of from 20 to 30 and over 60 is two-sevenths to one-fourth of the average. Most of the car owners are people from 40 to 59 years of age. The proportion of this age group among car owners is almost twice as great as among the entire population. This is explained by the fact that the population in this age group is the more skilled and active part of the workers and has a greater income. In families where the head of the family is someone under 30 years of age or over 60, the per capita income, as a rule, is lower.

In spite of the planned improvement of the well-being of the workers, which is directed toward increasing the proportion of groups with high incomes, in the near future there will still be that part of the population for which it will be difficult both to acquire and to intensively operate the motor vehicles that are being produced now. Therefore in the sales structure of small cars they are deliberately leaving this part of the population out of the potential

buyers, which cannot be recognized as correct from a social or economic standpoint. One must recall, however, that the range of potential buyers will expand only with a low retail price for these motor vehicles.

A reduction of the production cost of the motor vehicle can be achieved as a result of improving the design parameters, applying new materials, optimizing technological processes and also increasing the scale of mass production.

A no less important factor is the amount of turnover tax which is included in the retail prices for the passenger cars. Now the ratio between these amounts depends little on the consumer qualities of the motor vehicle. Thus the proportion of turnover tax (ratio between retail price and wholesale price) for the Zhiguli VAZ-2107 automobile is only 20 percent more than for the Zaporozhets automobile. It seems that this practice cannot be recognized as correct. As the sizes and engine capacities of the motor vehicles increase there is also an increase in the expenditure of shortage materials and labor resources consumed in the process of production, and during the operation there is an increase in the consumption of irreplaceable energy resources, the negative influence on the environment increases, and so forth. Obviously it is necessary to introduce the principle of progressive increase of the turnover tax as the sizes of the motor vehicles increase. In the retail price of small cars the relative amount of turnover tax should be included at the minimum level.

As practice shows, the stable demand of the population for technically complicated goods such as passenger cars depends on how developed the system of service is and whether the consumers are continuously supplied with spare parts. But this is a separate subject which is also being considered in this issue of the magazine.

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## ESTONIAN TRANSPORTATION SERVICES DISCUSSED

Novosibirsk EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA (EKO) in Russian No 5, May 85 pp 150-158

[Article by M. Sablina (Novosibirsk): "Drivers and Pedestrians--Report From Estonia"]

[Text] The Estonian SSR occupies first place among the republics of the country in terms of the level of the introduction and use of motor vehicles. It has the most motor vehicles per 1,000 residents--97. Specialists think that the optimal ratio is 100 vehicles per 1,000 residents, so the Estonian level is close to this. The best roads in the country are to be found here.

### What Is "Autom?"

The aforementioned figures cause one to assume that the level of organization and the volume of work with motorists in the republic are also high. Many car owners travel their first kilometers with the help of specialists from the republic society of car lovers, Autom, where they receive driver's licenses. There are many courses for training drivers in automotive enterprises and DOSAAF organizations too, but the "final result" is highest in Autom--90 percent of those who have taken the course receive their driver's licenses. In 1983 more than 3,000 nonprofessional drivers were trained here. Each rayon division of the society has its own well-equipped training room. The society has its own garages, training vehicles and training grounds. There are groups of owners of various kinds of machines. The so-called autodroms are usually created for sports competitions or for testing vehicles produced by the automotive plants. Autom has its own autodrom at which driving skills can be acquired under any road conditions, stunt driving can be practiced and one can learn to drive on snow and ice.

The lectures and practical studies conducted by Autom specialists have won widespread popularity. The good training of the "graduates" of the society are a direct cause of the fact that Autom members have the least number of accidents.

The competitions in driving mastery which are organized by Autom are also popular. Drivers who have been driving for no less than 2 years can participate in them. The competitions are conducted in several rounds.

According to the conditions of one of them, it is necessary to travel 10,000 miles in a year without having their coupon punched. Then comes the second round in which the participants have traveled for 20,000 kilometers without being written up by the state automotive inspection and have successfully passed the exams for driver's licenses. The third round includes "aces" who have also participated in competitions in stunt driving. There are more than 300 of these people in Tallinn.

Since far from everyone can be allowed to participate in these competitions, Autom also conducts about 1,000 mass sports events a year. These include popular rallies (winter youth rallies devoted to important dates, "rallies for everyone," competitions for stunt driving and multiple events).

These truly mass measures alone would probably bring glory to any society of auto lovers. But Autom organizes, for example, winter celebrations as well--with tea, pancakes and, of course, driving competitions. For members of the society and their families they organize mass conventions and trips of Autom--the organizer of collective automotive tourism. Under its jurisdiction are Karavan clubs which bring together the owners of dachas on wheels and Unik which are created for those who are interested in old cars. In Tallinn there is an automotive service station for the city Autom council. Only members of the society can use it.

In a suburb of the capital, Rokka-Al-Mare, a service station costing about 300,000 rubles which was constructed with the money of auto lovers will soon be opened. The necessary equipment has been obtained and will apparently soon be installed. In the repair shop there are to be five hoists, two inspection stands and other equipment. The station was designed by the Kommunalproyekt Institute. Local organizations of the Stroydetal' and Estonenergo plants rendered a great deal of assistance to the city Autom council in the construction. The plans include the construction of a campground near Tallinn on the same basis.

The main source of financing is contributions from members of the society. One must say that, for example, in the RSFSR organizations of VDOAM, in keeping with the charter and provisions concerning primary organizations, the societies can spend 25 percent of their overall income from members' contributions for the development of their own material and technical base, the payment of teachers and so forth. But these funds are not always used completely. But in Autom all of the funds are spent. It includes 17 territorial (rayon and city) councils and each has its own account in the Gosbank (in other territorial organizations these accounts exist only at the level of the republic societies). This makes it possible to dispose of the resources more efficiently and economically.

The territorial societies are very active. This is discussed by the chairman of one of the best rayon councils, K. Viirok:

"The Rapla Autom Council has been in existence for 10 years. We have 2,000 members--half of the car owners in the rayon. I do not think that the other half is neglected either because most of the measures the council takes are on sovkhoses or at enterprises. In our rayon there are also republic congresses



to struggle for traffic safety. The participants come as families and live in tents. We are not forgetting about the children--after all, they will be drivers too. For them we have special competitions and meets. For the seventh year now the rayon has held first place among the territorial Autom councils.

"We have a fairly good base. We have a small automotive fleet for training drivers (seven training cars and motorcycles). The society's building was constructed with the members' contributions. For the training classes we have purchased an old building and reequipped it. Incidentally, the rayon council is supposed to have a staff of two workers, but we hire as many as we need. For example, we invite instructors who are paid with the students' fees and we train them conscientiously. In 1981 we introduced a technical service point for our members. It has imported technical equipment. Two masters are working there, including an instructor-consultant who helps the car lovers with self-service.

We have no great difficulties with automotive service: if someone needs complicated repair nobody wastes working time traveling to the automotive service station and waiting. The order is placed on the telephone and it is carried out at the appointed time. I think that the main thing is not to wait around for something to happen, but to take charge of the situation. Then the society of automobile lovers will be able to give a great deal to its members and not only gather fees and offer them the goods which all car owners should receive regardless of whether or not they are members. Incidentally, in Estonia such a thing is probably impossible: it is not by accident that they say that almost every Estonian is almost a lawyer and has an excellent awareness of his rights...."

I shall add to what has been said, that the opinions regarding what the societies of automobile lovers should engage in are shared by others. Many car owners, tired of the ordeals they have with automotive service and acquiring spare parts or places in garages or parking spots, think that the main task of the society should be to help the automobile lovers in this. In Estonia they resolutely adhere to a different point of view: everyone should engage in this matter. Rendering these services is the business of specialized organizations. In many places if one has not become a member of the VDOAM one cannot obtain driver's training, acquire a spot in a parking lot or enter a garage cooperative. The essence of Autom's activity is not to help its members "handle the shortage" but primarily to conduct training and increase the mastery of the drivers, to organize mass sports measures, automotive tourism and technical creativity and, of course, to fight for traffic safety on the roads. The following fact shows that this direction for the work of the society satisfies the automobile lovers. After abolishing the so-called "coupon for public warning" which gives the automobile owner privileges after the first violation of traffic rules in all republics, including the RSFSR, there was a reduction of the number of members of the society. This did not happen in Estonia.

Red, Yellow, Green....

Tallinn is one of the few cities in the country where the number of traffic accidents is decreasing even though there are more and more vehicles. In PRAVDA (13 November 1983) it was noted that successful work is being carried out for publicizing the traffic rules in Tallinn and Leningrad. The problem of highway safety is being resolved here, at first glance, by the same organizational measures as in other cities. Under the Estonian SSR Council of Ministers there is a special commission for traffic safety, and its chairman is the deputy chairman of the republic Council of Ministers. There are corresponding city and rayon commissions. The Council of Public Inspectors is also operating actively. There are 1,300 of them in Tallinn and 6,000 in the republic.

Card catalogues have been introduced at automotive enterprises: on the cards they write data about all violations--who, when, where and why. By analyzing these data they draw, for example, this conclusion: this is where pedestrians cross the street and it is necessary to have an underground passageway.

Traffic safety is publicized by many means: through the Znaniye Society, on the radio and on television. Once or twice a week the republic television station gives its information program. In every program 3-4 minutes are allotted to accidents on the streets and highways. Twice a month there is a half-hour program entitled "Circular Traffic." Each month they have the program "Man, the Automobile and the Highway."

The special feature of this publicity in Estonia is that it is presented not in the form of rules which forbid people to do things, and not on the level of sad statistics. It is based not on fear of punishment or possible consequences, but on an analysis of the psychology of drivers and pedestrians. An old aphorism says that everyone wants to be attractive, intelligent and talented. And, let us add, alive.... If someone does something to indicate the opposite, this means that there is a reason for this. It must be found and eliminated as much as possible.

Here one cannot but recall the newspaper INFO--the organ of the Tallinn GAI, the Council of Public Inspectors and the Autom Society. This publication is the only one in the country. The first issue (INFO has been published since 1979) defined the goals of the publication thus: it is primarily information for contemplation, good advice, clarification and warning. In INFO one will not find the usual kind of information of the GAI concerning "terrible accidents" on the roads. Accidents are not at all accidental, and therefore the newspaper has both analysis and generalization of situations as well as recommendations. The overall concept is this: it is not enough to study or even have a firm knowledge of the rules. It is necessary to develop a correct manner of behavior under traffic conditions and to teach participants how to behave correctly in complicated situations. People dislike it very much when they are given reprimands. It is necessary to search for some other ways of appealing to their reason and feelings. It would seem that this is a long-known truth. But still....

A motorist has broken the rules. But what has led him to this? Research has shown that road hogs, who deliberately ignore the rules, comprise no more than 10 percent of the overall number. The rest of them simply make mistakes. The driver can be compared with an operator who has to deal with a constantly changing situation and must make correct decisions under difficult conditions. As research shows, an emergency situation arises because the driver either has not perceived changes in the road situation (approximately half the cases) or he has made an incorrect decision. But what if in addition to this the driver is not very experienced? INFO presented a drawing which shows how one and the same segment of road is seen by an experienced and an inexperienced driver. It explains much about the causes of accidents. Moreover, a familiar view of a street in the eyes of an inexperienced driver is so distorted that it seems strange that he dares to drive at all....

When a motorist is tired he will miss an important signal or proceed incorrectly or make an incorrect prediction, and as a result he takes the wrong action. Therefore the solution to the problem is not stepping up control and supervision which, in the opinion of many, will take care of all problems and lead to order on the roads. Increasing this kind of supervision, in the first place, is effective only for those who actually deliberately violate the rules. But, as we understand, these people comprise no more than one-tenth. In the second place, the inspector can hold the driver responsible only when he has broken some formal rule. Yet motorists most frequently make mistakes in failing to carry out unwritten rules. Within the limits of what is permitted the driver himself can determine his speed, his distance, when to speed up and when to slow down. Moreover the "Draconian measures" increase the burden on the psyche of the driver, which is great in any case. The fear of making a mistake, if one is not too confident about driving, gives rise to new problems.

This means that one needs an instructor more than an inspector, and advice more than reprimands. This approach to the situation of "driver, pedestrian and road" is a part of the program and is highly publicized in Estonia. And in practice, for example, there is a permanent experiment being conducted here for reducing the speed on the roads of the capital to 50 miles an hour. On the main highways the speed is higher, depending on the conditions. The results could be seen immediately: the frequency of highway accidents dropped by half as compared to preceding years.

To interpret the psychology of the driver and the pedestrian, to analyze typical mistakes and to show ways of eliminating them.... What does the chief of the GAI of the Tallinn UVD, V. Soo, think about this?

"Traffic safety depends largely on the relations between the drivers and the pedestrians. We are reaching a point where each participant in traffic is not afraid of the other, but respects him, understands him and knows his capabilities. For example, what kind of transportation causes the most 'unexpected' accidents? Motorcycle traffic. Therefore in order for motorcyclists to stand out better among the street traffic, for the second year we have been conducting an experiment under the title "Month of Sundays": motorcycle owners drive during the day with their lower beams on. The number of accidents involving motorists immediately decreased by one-third. In



general in the republic the low beam of the light is turned on for the slightest occasion--both rain and snow. Thus the vehicles can be seen better. We also try to make more "visible" other "unpredictable" participants in traffic--children. For them we are introducing light reflectors on their clothing--large badges which at night when a light falls them shine brightly....

"And one other consideration related to the psychology of the driver. Under conditions whereby each person crosses the street wherever he wants to the safety of the pedestrians, strange as it may be, is greater than when there is partial order. No, this is not an appeal to anarchy. It is undoubtedly best to have complete order: the pedestrians go out into the street only at crossings and in numbers sufficient to alert the drivers. Next in line comes complete disorder, and at the very bottom--the current situation: some people cross at the crosswalks while other jaywalk. It is worthwhile to think about this...."

Such reflections have brought about many innovations for increasing traffic safety. For example, safety belts are used everywhere now and helmets for motorcyclists were introduced for the first time precisely in Tallinn. New systems of traffic lights were also tested here.

In general Tallinn residents have come to the conclusion that traditional ideas are not always the best ones. For example, when a pedestrian unexpectedly appears in front of the vehicle itself the driver honks the horn. As a rule, the individual is frightened and loses those very seconds which could have prevented the accident. As soon as an analysis showed this pattern it was immediately made common property. Now horns are heard less and less frequently in such a situation.

The development of ingrained habits in children is especially important. A whole series of puppet films is being shown on television for them. Quizzes are very successful among the young people. But the main thing is work in the schools and kindergartens. In general these classes are conducted everywhere in the country and nobody is surprised about them. But in Estonia this work is done on a much larger scale.

Benita Pau (in Estonia everyone knows her and calls her simply Aunt Benita; she is a member of three commissions for traffic safety and for many years has been giving lectures for children and adults) says: "One must be able to see the street through the eyes of a child, to help him to study the street, to know its 'secrets,' because it is only at first glance that it is simple, and in reality it has 'traps'--deceptive situations. In order to help the child, in schools and kindergartens they hold 'minutes' on traffic safety. At these 'minutes' one does not hear general appeals and reminders. Concrete situations are considered. One must say that there is much that is unexpected for the adult too. For example, the unregulated striped crossing is dangerous. Usually a person feels safe on it and thinks that the driver must put on his brakes. But this is not the case.

"It is necessary to understand the psychology of the child and try to help him. For example, many accidents with children happen at bus stops. The



reason? The school child is afraid of being late and runs toward the bus, forgetting about everything. It was necessary to convince the teachers not to scold children for tardiness. Life is more valuable. Pedestrian certificates are given to children in kindergartens.

"In 1981 there was a sharp jump in the number of accidents involving children--25 percent. There were detailed articles in INFO, VECHERNYYTALIN, on the radio and on television. As a result, the number of accidents involving children dropped by half."

What has the Estonian experience shown us?

Many problems that bother motorists can be solved within the framework of territorial societies of motorists if they do not wait for someone else to do the job, and solve their own problems through their own efforts, relying on their own initiative, forces and means.

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## RESPONSE TO ARTICLE ON UPDATING PRODUCTION

Novosibirsk EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA (EKO) in Russian No 5, May 85 pp 159-164

[Response to article by V. N. Kellik and A. Yu. Kukrus, "Updating Production Requires a System of Measures," EKO, No 2, 1984, by E. M. Torf, candidate of economic sciences, Institute of Socioeconomic Problems of the USSR Academy of Sciences (Leningrad): "Economics of Experimental Productions"]

[Text] Experimental productions are being mentioned more and more frequently in economic literature as the unit whose weakness essentially retards scientific and technical progress. Even the decree of the CPSU Central Committee and the USSR Council of Ministers of 24 December 1968, "On Measures for Increasing the Effectiveness of the Work of Scientific Organizations and Accelerating the Utilization of the Achievements of Science and Technology in the National Economy," envisioned a number of measures for the development of an experimental base for scientific research, planning-design, design and technological organizations. But these measures were not fully realized, as a result of which the decree of 18 August 1983 "On Measures for Accelerating Scientific and Technical Progress in the National Economy," again points out that the experimental-production and experimental base of many enterprises lags behind modern requirements, and it earmarks "implementing a complex of measures directed toward accelerated creation and technical equipment of experimental bases and productions."

Successful implementation of these measures will require additional efforts for studying the economic peculiarities of experimental productions. We actually "do not have a real economics of experimental production (economics OEP)," as V. N. Kellik and A. Yu. Kukrus correctly point out. They are correct in giving certain reasons for this situation--the lack of sufficiently complete accounting and statistical reporting, and the small amount of research.

But it seems to us that the main reason is something else. Until recently experimental production has not had a legal status and has not been recognized by society as a special type of production which appears as a result of division of labor in the sphere of scientific and technical preparation of new scientific knowledge for use in material production. Neither in the provisions concerning scientific research, design, planning-design and

technological organization nor in the provisions concerning the scientific production association is experimental production even mentioned. In various branches of industry experimental enterprises have various status. Thus in the chemical industry they are included in the sphere of science and scientific service, and in machine building they are on a par with series production enterprises.

In statistical reports data about experimental productions are limited to the number of productions of various types and the overall number of people employed in them. There are no data on expenditures for experimental work. Because of these factors there are considerable difficulties in economic analysis of the experimental base of industry.

The shortage of knowledge about experimental productions is at the same time both the cause and the effect of the fact that there is no economics of these productions as a special scientific area. Without adequate information about the object one cannot create a science about it, and without scientific ideas it is difficult to improve the control of the object.

Today an important step has been taken in recognizing the specific nature of experimental production and its role as the link that joins science and production: we have developed and approved provisions concerning the experimental enterprise, including one which is part of a production and scientific-production association, or a scientific-research, design, planning-design or technological organization. The recognition of scientific production as a special one along with unit production, small-series, series and mass production<sup>1</sup> makes it especially crucial to develop its economics into an independent scientific area.

Methodologically the task can be resolved by revealing the principle businesses in the purposes of series and experimental productions and studying these differences in the nature of the productive forces and the production relations of the latter. The goal of series production consists in satisfying the needs of the society for products which meet these demands in terms of quality and quantity at a given moment. The goal of experimental production is to prepare for updating series production on the basis of scientific and technical achievements, which will improve the satisfaction of public demands in the future. The different goals have as a result different products, elements of production and production processes.

Experimental productions are intended for embodying the results of applied scientific research work and technical developments. As a result, new and more effective means of production and technological processes appear. Being the link that joins science and industry, experimental production is distinguished from series production by the following:

its products are of an informational-substantial nature since the experimental models are intended primarily for testing by the consumer and obtaining information about their feasibility and effectiveness as well as methods of manufacturing;

as one of the stages in the process of "research--production," it inherently has indefinite expenditures and results, although to a lesser degree than in the stages of research and development;

it has a higher rate of updating of products and the material and technical base;

in a number of cases it performs two economically different functions: it conducts experimental work and produces small series of new products whose experimental testing has been completed but series production has not been started because of a number of reasons;

it has specific organizational forms;<sup>2</sup>

its equipment consists of universal equipment intended for carrying out all or several projects as well as special equipment--for carrying out one project. Both of these are the last word in science and technology. Otherwise the developments, especially technological ones, become outdated before they leave experimental production and go into series production.

In equipment<sup>+</sup> productions the physical modeling of technological processes requires equipment of reduced sizes. Moreover the production areas are not used as well as in series productions since it is necessary to have a reserve area for carrying out new projects.

Experimental production should be maximally mobile both on the organizational-economic and on the technical plane. Labor here contains more elements of creativity than it does in series production and therefore the composition of the personnel is characterized by a higher proportion of engineering and technical personnel and more skilled workers and engineers and technicians.

As we can see, the peculiarities of the product and other characteristics of experimental products are extremely significant. Therefore the evaluation of the products from experimental production should take into account, in our opinion, their informational-substantial nature and the effectiveness of their utilization in the future. When setting norms for production capital one should pay attention to the existence of special equipment which increases the duration of the production process, the many kinds of products that are used and the relatively small need for raw materials, processed materials and batching items, the specific nature of the determination of the production capacity, and other peculiarities. In wages one should strive to reflect the creative nature of the labor and the higher skill level of the personnel. The lack of definite results from experimental work and the high level of updating of experimental productions must be taken into account in planning. It is necessary to envision, in particular, a reserve of time and resources for conducting emergency and unforeseen work. It is also necessary to have a specific normative base which combines experimental statistical normatives with the maximum ones.<sup>3</sup> The system of incentives should direct experimental productions toward increasing the degree of mobility, raising the technical level of developments, and improving the quality and reliability of experimental work, and not toward increasing volume indicators.



Today the system of management of experimental productions does not at all reflect their specific nature. Thus in the "Standard Methodological Instructions for Changing Over to the New System of Planning and Economic Incentive for Experimental Enterprises,"<sup>4</sup> all of the activity of experimental enterprises is actually reduced to the manufacture of models. Among the centrally planned indicators they include increasing the volume of the production of products, and incentive funds are formed from profit by analogy with series productions. To be sure, an attempt was made to reflect the specific nature of experimental productions by the introduction of correcting coefficients, depending on the proportion of experimental work in the overall volume of production. But this merely led to beginning to include in experimental work the output of small series of products, whose experimental development has been basically completed but series production has not been assimilated.

One must say that the correctness of producing small series of products have not yet been disputed. But if the development has successfully passed experimental testing is it true that the output of small series does not make it possible to assimilate new productions more successfully, to study the conditions for the consumption of the new products better, to win over new consumers, to reduce expenditures on material work, and, the main thing, to satisfy, at least partially, the new public demand?<sup>5</sup>

An efficient ratio between volumes of experimental work and the output of small series products is determined by the limit beyond which the specific features of the economics of experimental productions are manifested. Thus for the electrical equipment industry the peculiarities of the economics of experimental production "begin to be manifested in the nature of the change of the indicators of the economic effectiveness of production (increased expenditures per 1 ruble of commodity output, reduced output-capital ratio for fixed capital, slowing up of the turnover of circulating capital, reduction of profitability of production) after the proportion of experimental products in the overall volume of production becomes approximately 45 percent."<sup>6</sup> For other branches of industry the amount of this indicator can be higher or lower, but in any case it serves as the boundary which separates experimental production from series production.

Today in those branches of industry where small-series and single-unit production prevail the products are updated at accelerated rates. Each item and each series is experimental in nature, but experimental production becomes experimental-industrial production. In these branches the borderline is erased between single-unit and experimental production, and single-unit production acquires the features of experimental production, but the opposite is not true and thus it falls into the sphere of its economics.

Experimental productions are frequently called testing or experimental-testing productions. But testing work is included in scientific research while experimental work is an independent stage in the process of "research--production." Organizationally these kinds of work are usually joined together, but the differences in their purposes should be taken into account by the system of management. Therefore testing, experimental-testing and experimental productions are objects which are investigated by the economics

of experimental productions, but taking into account the specific features of the work that is performed.

One cannot say that the economics of experimental productions is not being developed at all. But the creation of a new area in science is frequently a lonely lot and in our country there is not a single specialized subdivision whose main activity would be the economics of experimental productions. What has been done in this area is the work of individual specialists or small groups that are included in subdivisions and organizations which are engaged in other problems. There is no unified coordination center.

V. N. Kellik and A. Yu. Kukrus made an interesting suggestion to satisfy the needs for an experimental base as a result of reducing the number of work stations in series production and correspondingly increasing their number in experimental production. This question is far from being as simple as the authors of the article present it, if only because the work stations in series and experimental productions are essentially different. In our opinion there can be another solution.

First of all it is necessary to reduce to economically effective limits the loading of experimental productions with the output of small-series products. To do this one should develop precisely series production so that it will be ready for updating as soon as the need is recognized and there is a possibility of putting new products into production. Another reserve is cooperation among scientific research, design, planning-design and technological organizations of the region in utilizing the experimental base. Finally, it is possible to transfer to these organizations small and sometimes even medium-sized enterprises as an experimental base. This path usually requires technical reequipment of the enterprises and sometimes reconstruction, and therefore it is hardly the most promising one. But it should be considered in complex with the other possibilities.

#### FOOTNOTES

1. They will be called series.
2. Concerning the classification of organizational forms of experimental productions see, for example: Torf, E. M., "Effektivnost' opytnykh proizvodstv" [The Effectiveness of Experimental Productions], Moscow, "Ekonomika", 1983; Shakin, V. A., "Povysheniye ekonomicheskoy effektivnosti opytnykh proizvodstv" [Increasing the Economic Effectiveness of Experimental Productions], Moscow, "Znaniye", 1981, pp 5-7; Bashin, M. L., "Novaya tekhnika i opytnyye predpriyatiya" [New Technical Equipment and Experimental Enterprises], Moscow, "Mashinostroyeniye", 1979, p 13.
3. Torf, E. M., "The System of Planning Experimental Productions on the Basis of Normatives," VOPROSY EKONOMIKI, No 7, 1982, pp 79-80.
4. "Sovershenstvovaniye khozyaystvennogo mekhanizma. Sbornik dokumentov." [Improvement of the Economic Mechanism. A Collection of Documents.], Moscow, "Pravda", 1980, p 136.

5. The limits of the effectiveness of the output of small series products in experimental productions have been considered in detail in the collection "Normativnyye osnovy planirovaniya nauchno-tekhnicheskogo progressa" [Normative Bases for Planning Scientific and Technical Progress], Leningrad, "Nauka", 1981, pp 104-108.
6. Shakin, V. A., "Povysheniye ekonomicheskoy effektivnosti opytnykh proizvodstv," Moscow, "Znaniye", 1981, p 20.

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## READERS' CONFERENCE HELD IN Khabarovsk

Novosibirsk EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA (EKO) in Russian 5, May 1985 pp 185-186

[Article by M. I. Ledenev, candidate of economic sciences: "What Was Said at the Conference in Khabarovsk"]

[Text] In the Far East there are no limitations on the subscriptions to publications, and the subscribers here are extremely exacting. The density of subscribers to the magazine EKO is, nonetheless, greater here than the average for the country. The readers are attracted not only by the intelligibility of the presentation, but most of all by the importance of the problems that are analyzed and the crucial nature of the issues that are discussed, which in daily life sometimes seem customary, but one can in no way become accustomed to them. And this was unanimously noted by all who spoke at the readers' conference in Khabarovsk.

I. Loginov, candidate of economic sciences, senior scientific associate of the Institute of Economic Research of the Far Eastern Scientific Center of the USSR Academy of Sciences, noted in particular that the majority of the articles published in EKO are addressed to the "businessman." But this person is interested in more than just the capital-output ratio and the output-capital ratio. His magazine must have many levels, that is, it must take him to account the entire range of interests of its readers at work and during their free time. "The shortest path to the introduction of scientific ideas into production is for them to be mastered as early as during the school days," said I. Loginov. "Therefore, the editorial staff should also think about the subscription price for students and about subject matter which could interest students of more than just economics departments and VUZes."

Ye. Shulepov, head economist of the Khabarovsk breeding farm, recommended that the editorial staff devote attention to the effectiveness of the material that is published and wished for more persistence. "The problems that are raised can and should be addressed again and again, consistently and relentlessly. Then they will not be suspended in air," he thinks. One such problem, for example, is the personal motivation of engineering and technical personnel to develop brigade organization of labor.



N. Klimchuk, director of the Far Eastern Branch of the Energomash All-Union Planning and Technological Institute, discussed the fact that clearly not enough attention or space is being devoted to the problem of increasing labor activity and solving this problem through increasing the personal motivation of the workers. The role of human relations in production is important here. The experience of many decades shows, in N. Klimchuk's opinion, that unless we improve the organizational forms and methods of management, these relations frequently become conformist, and it is not easy to restructure man's psychology. "If each worker were faced with the inevitable need to reduce the labor-intensiveness and improve quality, if it became crystal clear that work that was done in a slipshod manner would not be accepted at all and it would be necessary to pay for defective work," he said, "then many problems of strengthening discipline would be eliminated and each individual would be concerned about improving production."

V. Semenov, a worker of the kray health clinic, expressed his dissatisfaction with the fact that problems of the "economics of health" are pushed to the side in EKO. Stereotypes have taken form, both on the part of the managers of enterprises and on the part of workers who lose a good deal of time in illness-related matters. While speaking out in favor of relieving people of physical labor, one must not forget that they will then begin to have less exercise. While being in favor of the development of immense productions and the creation of industrial agglomerates, one must not forget that people are thus removed from immediate communication with nature. And for all of this, they pay with their health.

Many readers of Khabarovsk and the kray, naturally, are looking primarily for articles having to do with the Far East, and they rarely find them. It was suggested at the conference that we expand the Siberian subject matter contained in the magazine and consider regional problems of the Far East.

The deputy editor in chief of EKO, Doctor of Economic Sciences B. P. Orlov, who gave a report at the conference on problems of the development of the economy of eastern regions of the country, assured the readers of the magazine that all of the suggestions from the Far Eastern readers would be attentively considered in the editorial staff.

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## PRESTIGE OF MOTOR VEHICLES SATIRIZED

Novosibirsk EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA (EKO) in Russian No 5, May 85 pp 187-190

[Article by Leonid Treyer: "How To Become a Real Man"]

[Text] If you shudder from telephone calls and shrink in size at the appearance of your boss; if in the train they give you wet sheets for a ruble and you say "Thank you!"; if your mother-in-law considers you to be the family misfortune and at night you dream about the Tower of Pisa falling on you--it means that you are a "wimp"....

But do not fall to pieces! There is a sure way of becoming a real man--buy a car.

A shiny item on wheels will rid you of your shyness, your introspection, your impracticality and other qualities that get in the way of your life. Of course, not immediately and not all of a sudden. Everything in its time!

Having impressed the GAI worker with your knowledge of road signs, your third trip out you receive a driver's license and merge into the line of automobiles. On a summer day you timorously crawl out of the garage in your shining little Zhiguli and move along the street as if it were mined. Your wife, sitting on your right, and your wife's mother, sitting in back, at the same time give you signals that have opposite meanings. The passengers stubbornly crawl under your wheels, testing your nerves and your brakes. At the stop light, of course, your engine dies, and the row of cars behind you gives out a vicious roar. Drawing your head down into your shoulders, you will shrug off everything you can, but the machines road around you and every driver who has looked into your car gives you a verbal description in which the word "ass" is the only one that can be printed. Later, when you have somehow managed to get across the damned intersection, your wife and your mother-in-law also want to express their ideas about your capabilities. And then, for the first time in your life, you blow up. Friends and relatives, shaken by the revolt, will look at you and not recognize you. The metamorphosis has begun....

Within a year you will be stronger physically and morally. The horsepower of the vehicle, merged with yours, gives you added confidence. You stop being

shy of roaring dump trucks, you learn to tell when there is an automotive inspector a kilometer away and you love to drive fast. Sitting at the wheel you more and more frequently compare yourself with that popular favorite Belmondo, and the comparison does not turn out to be in favor of the latter. It is wonderful to see how you go to outdo the cheerful sound recording: "Smile, travelers!"

But it is too soon to be joyful, comrade! You are no longer an "ugly duckling," but you are not yet a "swan." You need experience in order to beat off that naive rapture of a dilettante. You need difficulties in order for your soul to be tempered. The automobile will provide you with both.

Someday you will become bored with rushing into the garage. Even though in the summer it is possible to keep the little Zhiguli in the driveway. You will install the latest antitheft device, which will even react to a mosquito. During the night you will jump up every half hour and rush to the window. You will have to finish sleeping while you are at work. The signals, which are just as reliable as those that protect Swiss banks, will give out a terrifying wail on one of the nights, waking up two microrayons. You will rush downstairs in your pajamas ready to kill, but it turns out to be a false alarm. And in the morning you will see your limousine on stacks of bricks instead of the wheels....

Your angry story makes no impression at the police station. There they show you a thick stack of similar reports and you begin to feel better at the thought that there are many who have suffered this. Your further accumulation of experience will involve purchasing wheels. Running around to the automotive stores will strengthen your calves but will not bring you any closer to your goal. "Only the second-hand store, sensitive to the demand, will respond to your problem. Without any special warning a citizen will appear before you like a mirage and ask quietly: 'What are looking for, brother?'" In a secluded place, afraid of witnesses, he will give you the wheels you are looking for at 3 times the ordinary price. And then he will disappear forever. And you will never know whether you bought the wheels which were taken from your own little Zhiguli....

After a short respite a suspicious knock can be heard in the bowels of your machine. You do not have to investigate the malfunction. It is enough to go to the service station where smiling chaps in overalls impatiently await your arrival. There you drink coffee, sitting in the foyer in front of the television set, and they make notes, lubricate, tighten and adjust. You hand them "tips" but in response they say: "You offend us, sir!" You add five to it, but they say firmly: "We will not take it, sir!" causing you to blush. You leave, enraptured by the service....

Such are the illusions. Reality will sweep them away in a trice.

At the service station you discover a large accumulation of private transportation. Car owners, divided up into groups, discuss the latest news: enterprising gypsies have begun to manufacture spare parts that are in short supply. Gloomy commuters are cooking soup on camp stoves. The people are shaving, dozing, and quietly going out of their minds while standing in line.

From time to time the gates open with a heavy groan, receiving a happy "Zhiguli owner" and then--silence again. In a cheerful voice you look for the "end" in order to begin your bivouac life and you are answered with a question: "On the record? Or do you have connections?..."

"Well, I," you mutter. "For myself...."

They laugh their heads off. Your answer is transmitted from the end of the line to the front like a fresh anecdote. They look at you like a little boy who thought that biscuits grow on trees. You clench your teeth, comrade, and stay patient. The laughter dies down and they explain to you that the backlog for registering is a month. And if you want it done sooner than that you will have to adjust!

And you begin to adjust. Through the husband of a friend of your wife you make contact with a docent who puts you in touch with a dentist. He takes you to a theater cashier. You will be sent along the chain like a relay baton until you are turned over to the proper person who has "entry" to the service station. With the song "Normal Heroes Always Go Around" you enter the desired gates. Then the alarming days stretch out. You will have the feeling that you have turned your beloved child over to alien hands. Moreover, your friends tell you an interesting story about how people removed good parts from a vehicle that is being repaired and put defective ones in. You will look into the windows of the automotive center checking to see whether they are working on your child. They return the vehicle to you in good repair but the suspicious knocking becomes louder, turning into a roar of thunder. "We have no cam shafts," the specialists tell you, "and they will not come in before the end of the year!"

Previously you would have thrown up your hands, but now you are one of those who will investigate any lead. All of your energy is thrown into searching for a cam shaft. Telephone calls, meetings, drinks, fraternization, services--you shake the city like an apple tree in the hope that something will fall out. Your notebook is bursting with names and opposite each one is the name of a spare part: Ivanov--bushing, Petrov--filter, Sidorov--relay, and so forth. There is no time to think and dream. Hamlet's "to be or not to be?" has been replaced by the 24-hour question: "Where to get it?"

You are saved by a mysterious master who is discussed with reverence. In his home shop he has absolutely EVERYTHING. He even has things which they do not have in the city of Tolyatti. If the master decides to he can do your work on time and with a guarantee. For he values his reputation. Anyone who becomes his client prolongs his own life. But it is more difficult for clients to make their way to him than it is to the Academician Amosov. The master prefers eminent figures in culture and trade. Writers give him collections of their essays and at movie festivals he sits next to members of the jury. You will have to go through serious competition in order to interest the master. You might prepare his children for the entry exams to the VUZ. Or you might arrange for his wife to get cut rates without having to do anything. There are variants. In the end the master will cast a gracious gaze upon and will work on your Zhiguli. From that moment you will move into the guild of favored car owners.



In order to complete the metamorphosis it takes more than just additional income. The fact is that expenditures on maintaining the car are increasing each year. It has been calculated and proved that it is less expensive to get about in a taxi than in a private "mobile." This is too bad. Searching for monetary compensation will lead you on the wrong path. In the region of the bazaars, railroad stations and restaurants you will hunt down passengers, earning rubles for "amortization." And it is not impossible that you will discover that a similar path will increase your wages. Your appetites will begin to grow. The idea of purchasing a new vehicle will appear....

Nobody will believe that 3 years ago you were tender and vulnerable and were the last to take a seat in the bus. Now you yourself offend whomever you want to. Your relatives respect you and call you the breadwinner. Your boss shakes your hand and frequently consults with you. Women follow you with their eyes and adopt advantageous poses. And all because you are--a real man!

This is what it means to purchase an automobile when there is a shortage of spare parts and underdeveloped service!

#### FOOTNOTE

1. There is no point in discussing the question of "Where to get the money?" Money can be saved, received as an inheritance, borrowed, won in a sports lotto or, in the extreme, one can find it in a little block, bricked up in the wall by some unknown merchant.

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